Vol. 893 Number 4

OFFICIAL GAZETTE

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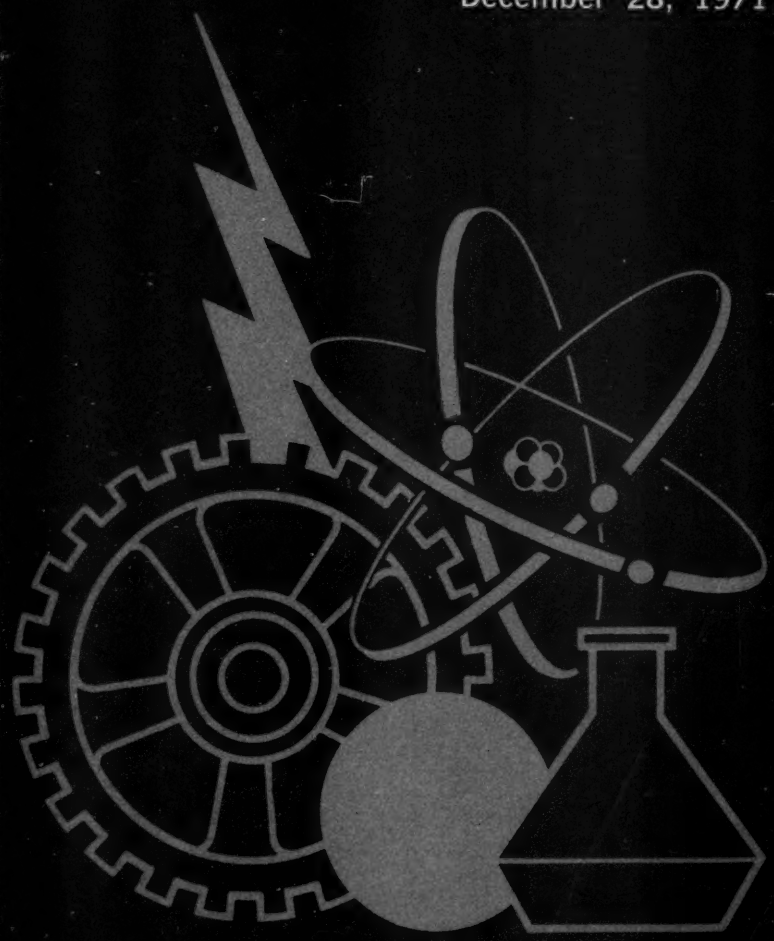
PATENTS

December 28, 1971



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Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

December 28, 1971 Volume 893 Number 4

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PATENT OFFICE NOTICES

Availability of Annual Report on Government Patent Policy

The Combined December 1969 and 1970 Annual Report on Government Patent Policy of the Federal Council for Science and Technology recently has been published.

The report assesses the effectiveness of the 1963 Presidential Statement of Government Patent Policy based on the information available from the seven years' operation, and describes the progress made to date by the Committee on Government Patent Policy.

The report contains:

The revised Memorandum and Statement of Government Patent Policy issued by President Nixon on August 23, 1971 and an explanation of the revisions.

A report on a Government-wide comprehensive patent licensing program. This report contains the proposed licensing regulations to be promulgated by the General Services Administration. It also contains legal memoranda of the Department of Justice which discuss the concept of issuing limited exclusive licenses on Government-owned Inventions.

A statistical analysis of the Government's patent operations for fiscal years 1963 through 1970. This report includes the total number of invention disclosures reported to the Government agencies, the type of patent clauses used in R & D contracts, the extent of patent protection sought by the Government, and the available information on the licensing of Government-owned patents.

A list, by agency, of all statutes, memoranda and regulations pertaining to the allocation of rights to inventions. This list also contains the identity of the office within each agency which has the primary responsibility for Government patent policy matters.

Information on the merger of the Patent Advisory Panel and the Committee on Government Patent Policy of the Federal Council for Science and Technology.

The report may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, for $1.25. A check or money order made payable to the Superintendent of Documents must accompany your order.

O. A. NEUMANN,
Executive Secretary,
Committee on Government Patent Policy
Federal Council for Science and Technology.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,853,736, A. Gussoni, MACHINE FOR THE MANUFACTURE OF BOTTLES FROM PLASTIC MATERIAL; 3,011,216, same, METHOD FOR PRODUCING HOLLOW BLOWN ARTICLES FROM THERMOPLASTIC MATERIALS, filed Jan. 29, 1971, D.C.N.J. (Camden), Doc. C–125–71, *Samuel Dubiner* v. *Jomar Industries, Inc.* Stipulation of dismissal with prejudice, July 7, 1971. Same, filed Aug. 2, 1971, D.C.N.J. (Camden), Doc. C–27–71, *Samuel Dubiner* v. *Wheaton Industries, Inc.* Stipulation of dismissal, Aug. 2, 1971.

2,925,719, Robbins and Linn, REFRIGERATING PACKAGE, filed June 8, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1375, *Kwik-Kold, Inc.* v. *American Hospital Supply Corporation.*

3,011,057, H. O. Anger, RADIATION IMAGE DEVICE, filed Aug. 26, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2088, *Hal O. Anger and Nuclear-Chicago Corp.* v. *Nuclear Data, Inc.*

3,011,216. (See 2,853,736.)

3,017,187, J. W. Ryan, MULTIPLE SPEECH PHONOGRAPH, filed July 20, 1971, D.C., S.D.N.Y., Doc. 71–3231, *Mattel Inc.* v. *Ideal Toy Corp.*

3,031,680, R. Compiano, BOWLING GLOVE, filed Mar. 24, 1967, D.C., M.D. Fla. (Tampa), Doc. 67–141–C–T, *National Athletic Supply Corp.* v. *Muscle-Matic, Inc. et al.* Judgment in favor of plaintiff, Jan. 11, 1971.

3,046,805, F. Van Gorp, WING PULLEY BELT GRIPPING DEVICE, filed Mar. 18, 1970, D.C., M.D. Fla. (Jacksonville), Doc. 70–4–C–Oc., *Van Gorp Manufacturing, Inc.* v. *Townley Industrial Plastics, Inc.* Judgment in favor of defendant, June 8, 1971.

3,061,332, L. S. Goulden, CARGO TRANSPORT ASSEMBLY, filed Sept. 3, 1971, D.C., M.D. Ala. (Montgomery), Doc. 1174–S, *Leo S. Goulden* v. *Dorsey Trailers, Inc.*

3,078,397, Tummers and Haayman, TRANSISTOR, filed Sept. 8, 1970, D.C., S.D. Fla. (Miami), Doc. 70–1307–C–CF, *U.S. Philips Corporation* v. *Solitron Devices, Inc.* Consent order, patent valid and infringed, July 20, 1971.

3,079,243, H. F. G. Ueltz, ABRASIVE GRAIN, filed July 2, 1971, D.C., W.D.N.Y. (Buffalo), Doc. C–1971–309, *The Carborundum Company* v. *Norton Company.*

3,110,034, J. A. Aileo, HELMET WITH VENT IN VISOR COVER, filed Dec. 21, 1967, D.C., E.D.N.Y. (Brooklyn), Doc. 67–C–1196, *Gentex Corp.* v. *Transaero, Inc.* Dismissed on the merits, Aug. 2, 1971.

3,110,465, Sugarman and Cable, PIPE HANGER, filed Aug. 5, 1971, D.C., N.D. Calif. (San Francisco), Doc. 71–1494, *Edward Sugarman and Mrs. Clyde F. Cable* v. *Charles A. Varney et al.*

3,114,026, W. S. Fortune, SOLDER REMOVING TOOL, filed Aug. 26, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2049–HP, *William S. Fortune* v. *Swiss American Precision Imports, Inc.*

3,124,674, Edwards and Wheatley, DATA COLLECTION AND DISTRIBUTION SYSTEM, filed Aug. 25, 1971, D.C., S.D.N.Y., Doc. 71–C–3781, *Electronic Assistance Corp.* v. *City of New York, N.Y.*

3,127, 518, C. H. Pruitt, SERVICE VEHICLE ELECTRICAL SUPPLY APPARATUS, filed July 6, 1971, D.C., W.D. Okla. (Oklahoma City), Doc. 71–429–C, *Cary H. Pruitt* v. *Vassar Manufacturing Company and I. D. Vassar.* Plaintiff's withdrawal of complaint against defendants without prejudice is approved and so ordered, July 27, 1971.

3,164,129, P. D. Rigterink, AUTOMATIC NEST GUARD, filed July 28, 1971, D.C., S.D. Ind. (Indianapolis), Doc. IP–71–C–394, *U.S. Industries, Inc.* v. *Storm System, Inc.*

3,164,933, A. Labowsky, GRINDING WHEEL, filed Mar. 19, 1970, D.C.N.J. (Newark), Doc. 321–70, *Diamond Productions, Inc. and Dorothy Labowsky* v. *Associated Diamond Products, Inc. et al.* Stipulation and order of dismissal, Aug. 25, 1971.

3,169,142, Knaggs and Nussbaum, METHOD FOR SULFONATION AND SULFATION OF ORGANIC COMPOUNDS, filed Aug. 24, 1971, D.C., W.D. Mich. (Grand Rapids), Doc. G211–71–CA6, *Stepan Chemical Company* v. *Lakeway Chemicals, Inc.*

3,214,844, Oates, Rahm, Kelley and Danko, APPARATUS AND METHOD FOR DRYING PARTICULATE MATTER, filed Feb. 2, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c232, *Midland-Ross Corporation* v. *Krispy Kist Korn Machine Company.* Motion to dismiss pursuant to Rule 41(a)(2) granted. Counterclaim to remain, Dec. 15, 1970. Motion to dismiss defendant's counter-plaintiff's counterclaim with costs of $97.30 taxed against plaintiff counter-defendant granted, Apr. 23, 1971.

3,249,270, B. Zuckerman, GARMENT SUPPORT MEANS, filed Aug. 31, 1971, D.C., S.D.N.Y., Doc. 71–C–3870, *Mr. Hanger, Inc.* v. *W. R. Grace & Co.* Same, filed Sept. 28, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71–C–1277, *Mr. Hanger, Inc.* v. *Plasti-Form Enterprises Corp.*

3,250,662, N. R. Seaman, COATED FABRIC, filed Aug. 25, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71–830, *Shelter-Lite, Inc.* v. *Reeves Brothers, Inc.*

3,257,668. (See 3,293,663.)

3,262,626, P. Davis, CUP, filed July 16, 1970, D.C. Mass. (Boston), Doc. C.A. 70–937–F, *Sweetheart Plastics Inc.* v. *Illinois Tool Works Inc.* Stipulation entered dismissing case without prejudice, July 28, 1971.

3,286,929, R. W. Henningsen, OSCILLATING SPRINKLER, **filed** Aug. 26, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2050–F, *The Leisure Group, Inc.* v. *W. D. Allen Manufacturing Co.*

3,293,663, T. D. Cronin, SURGICALLY IMPLANTABLE HUMAN BREAST PROSTHESIS; **3,257,688,** S. A. Braley, SILICONE RUBBER PROSTHETIC EAR FRAME, **filed** Feb. 19, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71–C–75, *Dow Corning Corporation* v. *Surgitek, Inc. and Medical Engineering Corp.* Consent decree, plaintiff owner of said patents which are valid and infringed; defendants permanently enjoined, Aug. 3, 1971.

3,298,039, J. Schmerler, SWIMMING POOL COPING, **filed** Feb. 3, 1971, D.C.N.J. (Newark), Doc. 148–71, *Major Pool Equipment Corp.* v. *Heldor Associates, Inc.* Consent judgment for permanent injunction as to the defendant filed on July 27, 1971 (case still pending as to third party).

3,305,186, Burdorf and Balkistone, TAPE TRANSPORT SYSTEM USING A DRIVE BELT CONTACTING TAPE PACKS, **filed** Aug. 23, 1971, U.S. Ct. of Cl., Doc. 693–71, *Echo Science Corporation* v. *The United States of America.*

3,312,130, L. A. Krautheim, APPARATUS FOR SLITTING ROLLS OF MATERIAL, **filed** Apr. 18, 1967, D.C.N.J. (Newark), Doc. 433–67, *Oscar I. Judelshon, Inc.* v. *Lever Manufacturing Corporation.* Stipulation and order of dismissal of action, Sept. 2, 1971.

3,332,544, A. H. Willinger, PACKAGING ARRANGEMENT FOR AN AQUARIUM, **filed** Mar. 19, 1969, D.C., E.D.N.Y. (Brooklyn), Doc. 69C293, *Aquariums Inc.* v. *Miracle Pet Products Inc. et al.* Order of discontinuance, Aug. 4, 1971.

3,523,402, West and Henchman, APPARATUS FOR BANDING TUBES, **filed** July 28, 1971, D.C., M.D. Pa. (Scranton), Doc. 71–313, *Cleo Wrap Corporation* v. *Elsner Engineering Works, Inc.*

3,560,979, D. A. Boelter, METHOD AND ELECTRICAL CIRCUIT FOR PROCESSING AIRPORT RUNWAY LOCALIZER AND GLIDESLOPE INFORMATION, **filed** Aug. 6, 1971, D.C., S.D. Tex. (Houston), Doc. CA 71–H–865, *General Aviation Electronics, Inc.* v. *Van Dusen, Inc., Narco Scientific Industries, Inc.*

Certificates of Correction for the Week of Dec. 28, 1971

Re. 27,146	3,574,138	3,585,074	3,589,893
3,372,734	3,575,510	3,585,177	3,589,915
3,475,771	3,575,750	3,585,183	3,589,932
3,503,707	3,576,792	3,585,188	3,590,047
3,515,979	3,576,922	3,585,245	3,590,056
3,517,537	3,577,515	3,585,576	3,590,243
3,518,247	3,577,866	3,585,602	3,590,484
3,530,164	3,578,449	3,586,225	3,590,502
3,532,490	3,578,561	3,586,289	3,590,857
3,533,876	3,578,614	3,586,442	3,591,221
3,535,433	3,578,787	3,586,522	3,591,227
3,535,938	3,578,968	3,586,577	3,591,246
3,541,929	3,579,438	3,586,807	3,591,372
3,542,500	3,579,480	3,586,929	3,591,504
3,545,611	3,579,505	3,586,952	3,591,711
3,547,153	3,579,783	3,587,307	3,592,615
3,552,545	3,580,127	3,587,479	3,592,701
3,553,321	3,580,176	3,587,518	3,592,775
3,554,413	3,580,581	3,587,759	3,592,921
3,554,987	3,581,105	3,587,771	3,594,419
3,557,439	3,581,412	3,587,942	3,595,609
3,558,518	3,581,494	3,588,042	3,595,613
3,558,520	3,581,565	3,588,424	3,595,628
3,561,028	3,582,463	3,588,530	3,595,713
3,561,801	3,583,295	3,588,551	3,595,789
3,562,178	3,583,333	3,588,635	3,595,841
3,566,042	3,583,920	3,588,653	3,595,883
3,566,239	3,584,149	3,588,660	3,595,959
3,569,762	3,584,687	3,589,264	3,597,387
3,569,779	3,584,781	3,589,305	3,597,465
3,573,429	3,584,848	3,589,374	3,597,476
3,574,054	3,585,067	3,589,617	3,598,551

Dedications

3,232,725.—*Herbert Campbell Secord,* Markyate Herts, England and *Bernard J. Clarke,* White Plains, N.Y. METHOD OF STORING NATURAL GAS FOR TRANSPORT. Patent dated Feb. 1, 1966. Dedication filed Sept. 16, 1971, by the assignee, *Vehoc Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,260,420.—*Harold B. Kohn,* Yonkers, N.Y. INTERNAL ACCESS MEANS FOR CONTAINERS. Patent dated May 10, 1966. Dedication filed Sept. 16, 1971, by the assignee, *Vehoc Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,270,700.—*Harold B. Kohn,* Yonkers and *Morgan Chuan-Yuan Sze,* Garden City, N.Y., *Harold L. Cook, Jr.,* Bellaire, Tex., *Herbert C. Secord,* Little Cheverells, Markyate, Herts, England and *Øystein Arvesen,* Haslum, Norway. SHIPBOARD INSTALLATION OF ELONGATED PRESSURE VESSELS. Patent dated Sept. 6, 1966. Dedication filed Sept. 16, 1971, by the assignee, *Vehoc Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,293,011.—*John D. Lewis,* Forest Hills, *Morgan Chuan-Yuan Sze,* Garden City, *Carroll O. Bennett,* Pelham Manor, and *Maurice E. Brooks,* Great Neck, N.Y., *Irvin H. Lutz,* Westfield, and *Howard B. Zasloff,* Rockaway, N.J. METHOD OF HANDLING NATURAL GAS. Patent dated Dec. 20, 1966. Dedication filed Sept. 16, 1971, by the assignee, *Vehoc Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,298,805.—*Herbert Campbell Secord,* Markyate, England, and *Bernard J. Clarke,* Columbus, Ohio. NATURAL GAS FOR TRANSPORT. Patent dated Jan. 17, 1967. Dedication filed Sept. 16, 1971, by the assignee, *Vehoc Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,319,466. *John D. Lewis,* Berkeley Heights, N.J. TEMPERATURE DROP DETECTION MEANS. Patent dated May 16, 1967. Dedication filed Sept. 16, 1971, by the assignee, *Vehoc Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,354,905.—*John D. Lewis,* Berkeley Heights, N.J., *Morgan C. Sze,* Garden City, and *Harold B. Kohn,* Yonkers, N.Y. FLUID DISTRIBUTOR. Patent dated Nov. 28, 1967. Dedication filed Sept. 16, 1971, by the assignee, *Vehoc Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,487,692.—*Harold L. Cook, Jr.,* Houston, Tex. METHOD AND APPARATUS FOR SAMPLING REFRIGERATED VOLATILE LIQUIDS. Patent dated Jan. 6, 1970. Dedication filed Sept. 16, 1971, by the assignee, *Vehoc Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,544,289.—*Norton H. Berlin,* Matawan, N.J. FLUID CONTROL SYSTEM FOR LIQUID STORAGE APPARATUS. Patent dated Dec. 1, 1970. Dedication filed Sept. 16, 1971, by the assignee, *Vehoc Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,557,094.—*Kenneth Butler,* Waterford, Conn. SUBSTITUTED ALKYL ESTERS OF α-CARBOXY ARYL PENICILLINS. Patent dated Jan. 19, 1971. Dedication filed Oct. 13, 1971, by the assignee, *Pfizer Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 14, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-13-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-22-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-09-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-21-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-06-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	4-07-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-01-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-04-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	10-05-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	10-23-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	9-02-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	9-03-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-17-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	12-09-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods: Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	10-06-70

Expiration of patents: The patents within the range of numbers indicated below expire during December 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... **Numbers 2,695,998 to 2,698,433, inclusive**
Plant Patents ..... **Numbers 1,328 to 1,338, inclusive**

REISSUES

DECEMBER 28, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,256
CIRCULAR KNITTING MACHINES

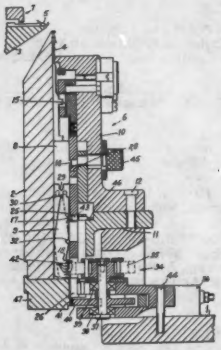
Frederick Henry Carrotte, Leicester, England, assignor to A. Kirkland & Company Limited, Syston, Leicester, Leicestershire, England

Original No. 3,470,713, dated Oct. 7, 1969, Ser. No. 652,838, July 12, 1967. Application for reissue May 28, 1970, Ser. No. 41,515

Claims priority, application Great Britain, July 15, 1966, 31,912/66

Int. Cl. D04b *9/06, 9/38*

U.S. Cl. 66—25 **2 Claims**



A circular knitting machine comprising single-butt needles which cooperate with cam segments, each segment having one track permitting passage of said butts without causing needle movement and a second track for producing knitting motion of the needles. Two butts on a selector jack associated with each needle selectively cooperate with said segments for aligning said needle butts to enter the second track when desired, and a locking jack between needle and selector jack, retains the two butts in their selected condition. Two of said segments include means for releasing and re-locking the locking jacks and a setting device selects the position of said two selector jack butts of each needle whilst the locking means is released, whereby the sequence in which said two butts are set may be changed during knitting.

27,257
BRAKE ACTUATORS

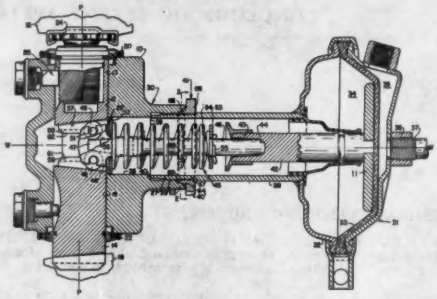
Frank T. Cox, Rochester, Mich., and William J. Williams, Ashtabula, Ohio, assignors to Rockwell-Standard Company, Pittsburgh, Pa.

Original No. 3,395,584, dated Aug. 6, 1968, Ser. No. 536,384, Mar. 22, 1966. Application for reissue June 9, 1970, Ser. No. 44,908

Int. Cl. F16h *21/44*

U.S. Cl. 74—110 **5 Claims**

In a brake assembly of the type having a reciprocable wedge actuator driven by a fluid pressure motor in an external casing with a tubular extension threaded into an internal bore in a boss on the actuator housing, positioning means comprising an abutment in the threaded bore against which the end of the casing extension may be seated, and a locking ring externally threaded on the casing extension and having an inclined end lip engaging a cooperating inclined end lip on the boss, with the inner



one of said inclined end lips being axially split so as to be flexible for compression locking.

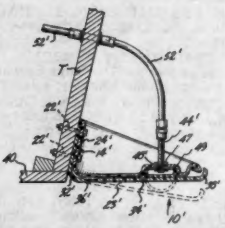
27,258
TRIM CORRECTING APPARATUS FOR BOATS

Robert E. Yunker, West Sacramento, Calif., and John P. Southern, Seattle, Wash.; said Yunker assignor to Delbert J. Barnard, Seattle, Wash.

Original No. 3,313,262, dated Apr. 11, 1967, Ser. No. 573,380, Aug. 18, 1966. Application for reissue Apr. 10, 1969, Ser. No. 860,442

Int. Cl. B63b *7/28*

U.S. Cl. 114—66.5 **19 Claims**



An inflatable bladder is positioned between a stern located support and a lift member swingable downwardly from a position substantially level with the bottom of a boat into a downwardly and rearwardly sloping position. Inflation of the tube causes it to press against the swingable member and deflect it downwardly.

27,259
IN-LINE PLURAL BEAM CATHODE RAY TUBE WITH AN ASPHERICAL APERTURE MASK

Wilfred D. Rublack, De Witt, N.Y., assignor to General Electric Company

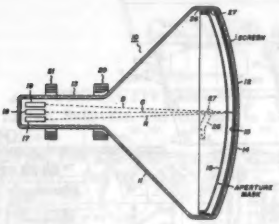
Original No. 3,435,268, dated Mar. 25, 1969, Ser. No. 573,604, Aug. 19, 1966. Application for reissue Apr. 1, 1970, Ser. No. 24,892

Int. Cl. H01j *29/02, 29/50*

U.S. Cl. 313—70 C **7 Claims**

A plural beam cathode ray tube comprising a spherical screen including a plurality of phosphor dots arranged in rows, an aspherical mask adjacent the spherical screen

and comprising a plurality of apertures arranged in rows, and a plurality of electron guns arranged in an in-line



configuration parallel with the rows of the screen and the rows of the mask.

27,260

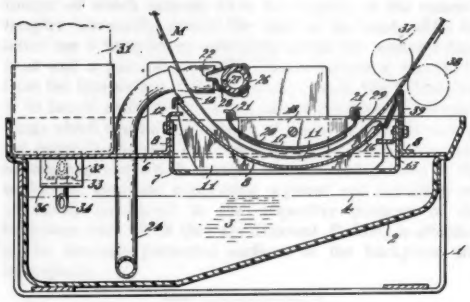
DEVELOPMENT OF ELECTROSTATIC IMAGES

Alfred K. MacKenzie, Wayland, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Original No. 3,359,945, dated Dec. 26, 1967, Ser. No. 587,198, Oct. 17, 1966. Application for reissue Jan. 27, 1969, Ser. No. 822,065

Int. Cl. B05b *5/02*

U.S. Cl. 118—637 **1 Claim**



Apparatus for developing electrostatic images on a sheet of material comprising means for feeding the sheet edgewise through a pool of developer with metallic members in close juxtaposition to opposite sides of the path of sheet through the pool, the member on the image side of the sheet comprising a screen, and means for circulating developer through the screen to the sheet.

27,261

STABILIZED OFFSHORE DRILLING APPARATUS

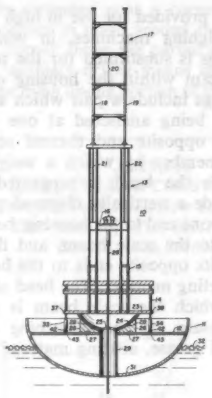
Raymond J. Bromell and Marion D. Lackey, Dallas, Tex., assignors to Kendrick Cattle Company, Sheridan, Wyo.

Original No. 3,390,654, dated July 2, 1968, Ser. No. 626,091, Mar. 27, 1967. Application for reissue May 11, 1970, Ser. No. 36,192

Int. Cl. B63b *35/00*

U.S. Cl. 114—.5 **13 Claims**

An offshore drilling apparatus mounted on a floating vessel so that the vessel can both roll and pitch relative to the drilling apparatus. Roll and pitch sensors, in response to movements of the vessel, actuate a plurality of hydraulic cylinder and rod assemblies disposed about the periphery of the base of the drilling apparatus to maintain the drilling string in a vertical position during pitch and roll of the vessel. The pitch and roll compensating means act in combination to compensate for simultaneous pitch and roll of the vessel. The drilling apparatus



includes hydraulic cylinder and rod means for suspending the drill string through the bottom of the vessel and means are provided for compensating for vertical movement of the floating vessel to maintain the drill string in a relatively fixed position relative to the earth.

27,262

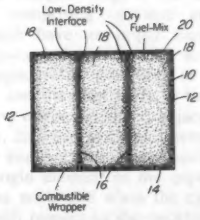
FUEL COMPOSITIONS

John W. Schick and John H. Stockinger, Cherry Hill, N.J., assignors to Mobil Oil Corporation

Original No. 3,402,031, dated Sept. 17, 1968, Ser. No. 628,786, Apr. 5, 1967, which is a continuation-in-part of abandoned Ser. No. 508,829, Nov. 19, 1965, and a continuation of Ser. No. 519,798, Jan. 10, 1966. Application for reissue Sept. 22, 1969, Ser. No. 862,996

Int. Cl. C10l *5/36*

U.S. Cl. 44—14 **7 Claims**



A fuel composition is provided comprising a combustible wrapper containing a plurality of [nonseparable adjoining] *adjacent closely associated fuel* sections *having interfacing surfaces at least slightly spaced,* each section comprising a mixture of petroleum coke, wood-sawdust, charcoal, an oxidizing agent capable of supporting combustion and a [heat-sensitive] binder *for adhering the particles of said fuel sections during combustion as a self supporting free-standing unitary structure,* wherein the interface areas between these sections have relatively lower densities than the remaining areas of the sections.

27,263
WEIGHER HEAD

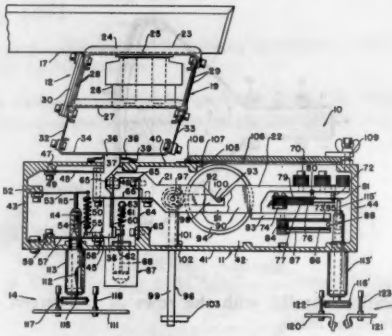
Donald W. Garnett, Grand Ledge, Mich., assignor to The Olofsson Corporation, Lansing, Mich.

Original No. 3,369,620, dated Feb. 20, 1968, Ser. No. 462,674, June 9, 1965. Application for reissue May 18, 1970, Ser. No. 48,754

Int. Cl. G01g *3/08*

U.S. Cl. 177—229 **16 Claims**

A weigher head is provided for use in high speed, high precision rotary weighing machines, in which head a system of leaf springs is substituted for the usual means by which a scale beam within the housing of the head is pivoted. The springs include a pair which are horizontally disposed, each being anchored at one end of the housing and at the opposite end thereof secured to a vertically disposed member by which a weighing receptacle associated with the head is supported. The leaf springs further include a vertically disposed pair, one of which is anchored at one end to the housing, being secured at its opposite end to the scale beam, and the other of which is secured at its opposite ends to the beam and to the receptacle supporting member. The head also includes further means by which the scale beam is periodically "zeroed" to compensate for the disturbing effect of a possible accertion of grease, coating material or the like upon the weighing receptacle, as well as to compensate out other factors influencing high-precision weighing.



Provision is also made to make adjustments for the purpose of maintaining precise accuracy of weighing within predetermined high and low goal limits.

PATENTS

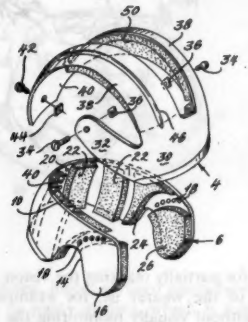
GRANTED DECEMBER 28, 1971

GENERAL AND MECHANICAL

3,629,864
PROTECTIVE HELMET

Roland N. Latina, Belleville, Ill., assignor to A-T-O Inc., Willoughby, Ohio

Filed Feb. 16, 1970, Ser. No. 11,655
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 A **7 Claims**

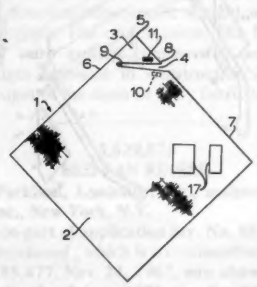


A helmet includes a backpiece and a crownpiece, the former of which extends from the vicinity of the wearer's temples rearwardly around the back of his head, while the latter has a foreportion extending across the wearer's forehead and a pair of protective bands extending rearwardly from the foreportion over the wearer's skull. The foreportion at its lateral ends merges into a pair of rearwardly extending wings which overlie the portions of the back piece located at the wearer's temples. The bands merge into a common connecting segment which overlies the rearmost portion of the backpiece. Both the connecting segment and the wings are adjustably connected to the respective portions of the backpiece over which they are disposed. Padding is attached to the inwardly presented surfaces of the backpiece and crownpiece.

3,629,865
BABY TOWEL

Sondra Weiner, 1400 W. Spruce Ct., Milwaukee, Wis.

Filed Feb. 11, 1970, Ser. No. 10,524
Int. Cl. A41d *13/04*
U.S. Cl. 2—48 **5 Claims**

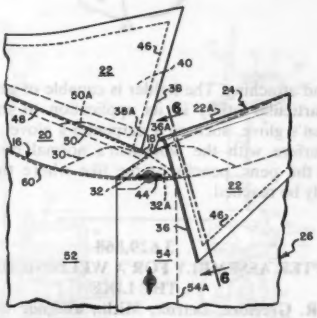


A towel and apron to be worn when bathing an infant and easily removable for drying. Towels varying in size and shape are partially separated near a corner to form a collar to removably secure in place around the neck with fasteners. The upper corner above the partial separation may be utilized as an auxiliary drying means and pockets may be attached to the main drying portion of the towel for bottles and the like.

3,629,866
SHIRT COLLAR CONSTRUCTION

Sidney D. Blue, 605 Park Ave., New York, N.Y.

Filed Dec. 10, 1970, Ser. No. 96,956
Int. Cl. A41b *3/06, 5/00*
U.S. Cl. 2—132 **5 Claims**



In a shirt of the type which includes a cloth body and a collar secured thereto along an upper marginal edge of the neck opening of the body, the collar including a neckband portion, a cape portion turned downwardly with respect to the neckband along a fold line and an elongated semirigid element disposed within the cape portion to displace the fold line upwardly with respect to the neckband portion so that the displaced portion of the fold line coincides substantially with the upper marginal edge of the semirigid element, the improvement comprising opposite end portions of the neckband which have an upper marginal edge tapering downwardly toward the shirt body to a substantially zero height with respect to the shirt body at the juncture between the neckband and the shirt body, a buttonhole disposed in one end portion of the neckband adjacent the juncture with the shirt body, and two semirigid elements disposed within the respective end portions of the neckband which contact with the semirigid element in the cape portion to prevent buckling of the neckband when the cape portion is folded downwardly with respect to the neckband and the end portions of the neckband are secured to each other in overlapping relationship.

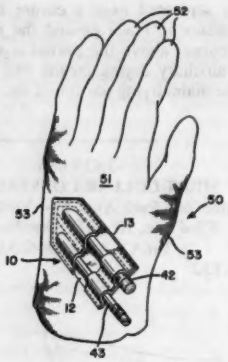
3,629,867
GLOVE WITH PENCIL HOLDER

Eugene M. Taylor, 409 Armor Pl., Vandalia, Ohio

Filed June 17, 1970, Ser. No. 47,086
Int. Cl. A41d *19/00*
U.S. Cl. 2—160 **2 Claims**

A holder for pencils, pens or other writing instruments has an adhesive coating applied to its lower surface so that it may

be attached to the surface of an article for easy accessibility to the contents of the holder. The stalls which receive the writing instruments preferably are formed with an opening in the middle for increased flexibility and the adhesive applied to the lower surface of the holder may be of the pressure-sensitive type and covered with a masking sheet for ease in handling and attaching. The holder is capable of general use but finds particular utility in its application to the back of a workman's glove, such as a carpenter's glove, since it does not interfere with the workman's normal movements but locates the pens, pencils or the like where they may conveniently be reached.

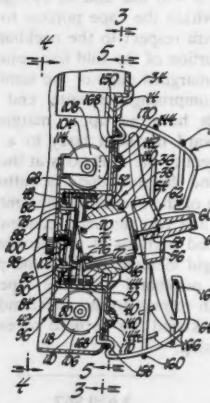


3,629,868

ADAPTER ASSEMBLY FOR A WELDING HELMET OR THE LIKE

Harry R. Greenlee, Detroit, Mich., assignor to Trison Corporation, Southfield, Mich.

Filed July 21, 1970, Ser. No. 56,908
Int. Cl. A61f 9/06
U.S. Cl. 2—8 **20 Claims**



An electric motor and fan driven thereby are carried by mounting means adapted to be detachably secured to the forward portion of a protective helmet or a face-shielding mask so as to be effective, when actuated, to draw fresh air into the mask or helmet generally about the operator's head and expelling such air through a forwardly directed opening, formed in the mask, in a stream-like path aimed at a selected direction with respect to the mask or helmet.

3,629,869

PARTIAL VISION-MASKING TRAINING DEVICE

Virgil L. Sweet, 657 Ravine Drive, Valparaiso, Ind.

Filed Oct. 3, 1969, Ser. No. 863,639
Int. Cl. A61f 9/04
U.S. Cl. 2—12 **3 Claims**

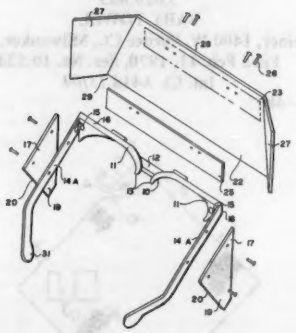
A device for partially masking the vision of a wearer to aid in training of the wearer as, for example, in dribbling a basketball without visually monitoring the same. The device includes a nosepiece integrally formed with and joining a pair of shields both of which have a U-shaped cut therein so that a wearer will have unimpaired straight-ahead vision but will have downward vision precluded when the device is in place on the head of a wearer and held in position by a band.

3,629,870

INSTRUMENT FLYING TRAINING DEVICE

Herbert J. Paisley, 392 Lyle Street, Winnipeg 12, Manitoba, Canada

Filed Nov. 28, 1969, Ser. No. 880,878
Int. Cl. A61f 9/04
U.S. Cl. 2—15 **1 Claim**



A nose-engaging portion having temple strips hinged to each end with peripheral vision shields on each temple strip and a vision shield hinged to the upper edge of nose-engaging portion with rearwardly and downwardly angulated end portions to said vision shield.

3,629,871

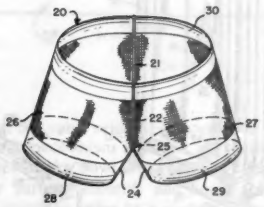
FULLY CONTOURED, HIGHLY STYLIZED PANTY-TYPE GARMENT AND PROCESS FOR MAKING SAME

Louis Sarmiento, Hasbrouck Heights, N.J., assignor to International Stretch Products, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 10,770, Feb. 12, 1970, and a continuation-in-part of 21,409, Mar. 20, 1970, and a continuation-in-part of 36,552, May 12, 1970. This application Nov. 3, 1970, Ser. No. 86,582

Int. Cl. A41b *9/04*

U.S. Cl. 2—224 R 4 Claims



A fully contoured, highly stylized panty-type garment (for example, panty or panty girdle), which is constructed in a novel manner, utilizing two or three separate pieces of fabric is disclosed. Each of the fabric pieces are of warp knitted construction, and are specially constructed to have integrally knitted selvedges of one-way stretch, elastic construction. In the finished garment, the elastic selvedges of the fabric pieces are joined to form either the waistband or the legband elastics. A highly stylized, fully contoured shape is imparted to the finished garment by utilizing, in the construction thereof, superimposed pairs of identical, generally trapezoidal sections of the warp knitted material in which the bases of the trapezoidal sections comprise legband selvedges and are substantially greater than the lengths of the upper edges of the trapezoidal sections which comprise the waistband selvedges. The opposite sides of the trapezoidal sections are defined by "178 Y" cuts in which the stem of the Y is perpendicular to the legband selvedge and the arms of the Y are generally parabolic. The garment is completed by sewing together the superimposed parabolic edges of the trapezoidal sections, thereby forming generally vertical, central front and rear garment seams, and then sewing together the opposite straight edges of each trapezoidal section to form a generally horizontal crotch seam. Where large body sizes are to be accommodated, a separate crotch piece is incorporated in the garment construction, extending in the front-to-back direction between the straight side edges of the trapezoidal sections. The crotch piece, like the main fabric section, is of warp knitted construction and has integral elastic selvedges identical in construction to that of the legband selvedges of the main or body fabric section.

3,629,872

BED PAN RINSER

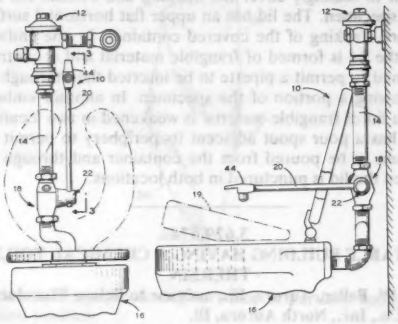
Richard G. Parkison, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.

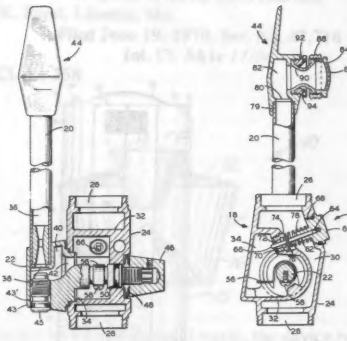
Continuation-in-part of application Ser. No. 884,780, Dec. 24, 1969, now abandoned , which is a continuation of application Ser. No. 685,477, Nov. 24, 1967, now abandoned. This application July 6, 1970, Ser. No. 52,401

Int. Cl. A47k *17/00*

U.S. Cl. 4—1 19 Claims

The present device comprises an apparatus for rinsing bedpans which may be connected to conventional plumbing. The apparatus includes a novel water diverter member operable to divert some of the water flowing in the plumbing





to a spray arm upon movement of the spray arm from a first off position to a second on position in which the spray arm is positioned to rinse the bedpan.

3,629,873

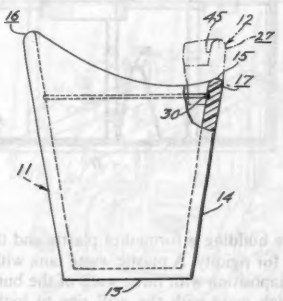
CONTAINER STRUCTURE

Harold W. Long, 4008 Mountview Road, Columbus, Ohio

Filed Apr. 16, 1970, Ser. No. 29,049

Int. Cl. A47k *11/12*

U.S. Cl. 4—110 10 Claims



A disposable container which is particularly suited for collecting and containing specimens of human female urine has

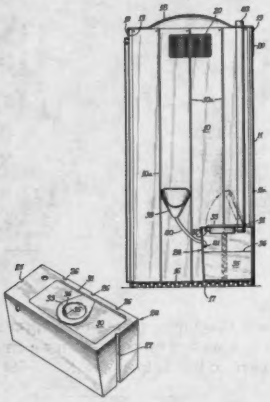
a body provided with an upstanding sidewall shaped at its upper end to engage the female pubic region and receive within its opening the labial portion of the genitalia. A lid is provided to engage over the upper terminus of the shaped sidewall to sealingly cover the opening and contain the collected specimen. The lid has an upper flat horizontal surface to afford stacking of the covered container. In one embodiment, the lid is formed of frangible material and is centrally weakened to permit a pipette to be inserted therethrough for withdrawing a portion of the specimen. In another embodiment, a lid of frangible material is weakened in two locations and it has a pour spout adjacent its periphery to permit the specimen to be poured from the container and through the lid when the lid is punctured in both locations.

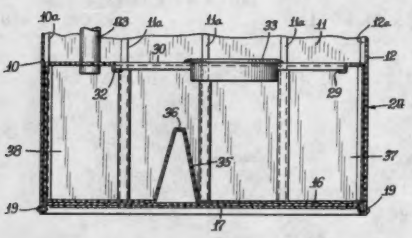
3,629,874

PORTABLE BUILDING HAVING A CHEMICAL TOILET THEREIN

Frank W. Beller, Aurora, Ill., assignor to Belson Manufacturing Co., Inc., North Aurora, Ill.

Filed Oct. 7, 1970, Ser. No. 78,760
Int. Cl. A47k *11/02, 11/12*
U.S. Cl. 4—119 **7 Claims**





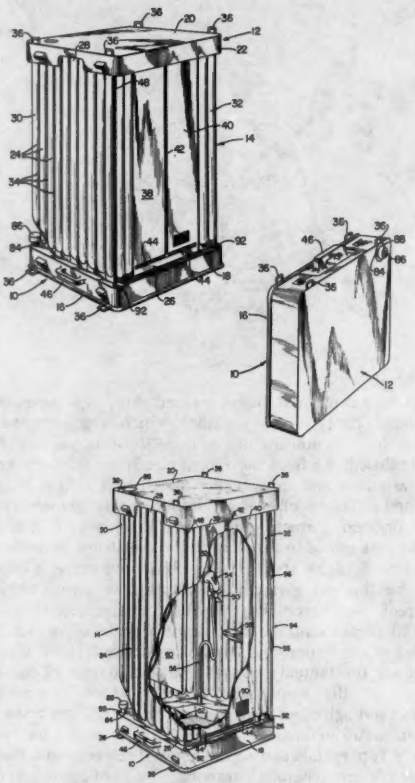
A portable building is formed of plastic and the walls have vertical ribs for rigidity. A plastic waste tank within the building is in juxtaposition with three walls of the building and has grooves which mate with the wall ribs to lock the tank in place. A weir in the tank divides the tank into two compartments. The toilet seat is over the larger of these compartments. A urinal on the building wall has a drain leading into that larger compartment.

3,629,875

PORTABLE INFLATABLE ENCLOSURE FOR PERSONAL USE

Doris I. Dow, 12616 Appaloose Pl., Broomfield, and Ernest P. Kollar, North of Broomfield, both of Colo.

Filed Feb. 4, 1970, Ser. No. 8,509
Int. Cl. A44k *3/22;* **F24h** *1/06*
U.S. Cl. 4—146 **18 Claims**



Crown and base member of corresponding size and shape peripherally connected to upper and lower ends of space-enclosing curtain. Longitudinal pockets on curtain inflatable to erect the enclosure and make it self-supporting. Crown or base or both may be hollow container for water with air pump to force water up to shower head. Other water source may be hose or external tank pressurized by any means. Same pump may be used to inflate curtain and pressurize water. Roof-type crown and pan-type base securable together to form carrying case for curtain and shower accessories. Similar enclosure used for toilet or lavatory and connected facewise to shower enclosure. Divided and zipped wall of shower protects lavatory room against water from shower room.

3,629,876

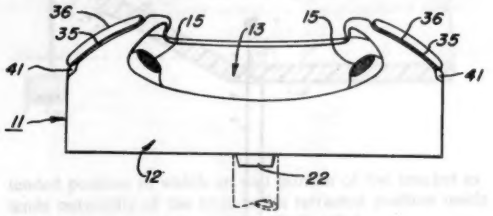
EYEWASH FOUNTAIN WITH INTEGRAL NOZZLES

Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Faucet Company, Berkeley, Calif.

Filed Nov. 28, 1969, Ser. No. 880,669
Int. Cl. A47k *1/04*
U.S. Cl. 4—166 **4 Claims**

An eyewash fountain especially useful in industrial and laboratory environments to provide a water discharge suita-

ble for flushing irritants from the eyes of a workman. The fountain includes a bowl having a pair of upwardly and inwardly facing nozzles through which an eye-bathing flow of water can be discharged for so flushing the eyes of a workman. A valve connected in the water supply line controls the flow of water to the nozzles, and operating mechanism associated with the valve selectively opens and closes the same. The operating mechanism includes activators located along opposite sides of the bowl and essentially forming a part of the exterior surface thereof, and such activators can be operated to open the valve by a slight downward pressure as by leaning thereon with the hands, forearms, or elbows.

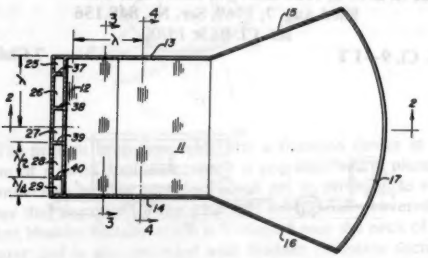


3,629,877

METHOD AND APPARATUS FOR WAVE FORMATION IN SWIM POOLS

Siegfried A. Schuster, One Berlin 39, Marinesteig, and Christian H. Boes, One Berlin 21, Bartningalle 7, both of Germany

Filed Aug. 7, 1969, Ser. No. 848,300
Int. Cl. E04h 3/18
U.S. Cl. 4—172.16 23 Claims



A swim pool is disclosed with a method and apparatus for forming waves for the enjoyment of the swimmers with the waves formed by an air pressure source directly acting on a plurality of separate portions of the water surface in wave-forming tanks to cause depression of the water and consequent formation of the waves without requiring any mechanical apparatus to be immersed in the water. The swim pool has a width equal to at least one wavelength of the waves in the water and a standing wave is caused to move along the length of the pool by applying force alternately on first and second parts of the water surface of the width of the pool.

3,629,878

SWIMMING POOL PROTECTION DEVICE

Robert I. Martin, Manheim, Pa., assignor to Rimar Manufacturing, Inc., Manheim, Pa.

Filed Mar. 23, 1970, Ser. No. 21,858
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172 4 Claims

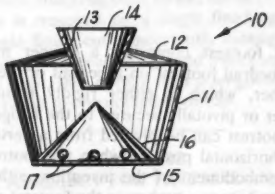
A swimming pool protection device comprising a resilient, water-resistant, hollow casing enclosing a quantity of air and a quantity of ballast material in sufficient quantities and proportion to buoy the device in water in partially submerged, vertical position.

3,629,879

LIQUID WASTE CONTAINER

Carl K. Forst, Linneus, Mo.

Filed June 19, 1970, Ser. No. 47,716
Int. Cl. A61c 17/04
U.S. Cl. 4—258 2 Claims



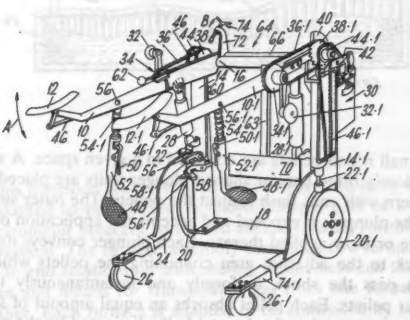
A device for receiving liquid waste, the device being on the order of a cuspidor. The main body of the device includes a flexible upper wall to which is secured an upwardly extending funnel which may be pushed downward onto an internal cone secured to the bottom wall of the device in order to close the device.

3,629,880

APPARATUS FOR ASSISTING INVALIDS

Johannes Nicolaas van Rhyn, Main Road, Klapmuts, Cape Province, Republic of South Africa

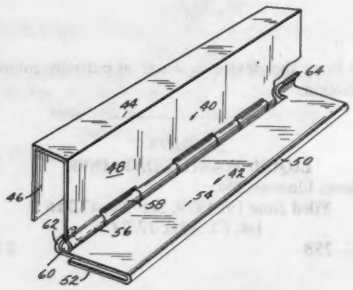
Filed Sept. 8, 1969, Ser. No. 855,965
Claims priority, application Republic of South Africa, Sept. 10, 1968, 68/5849
Int. Cl. B62m 1/14
U.S. Cl. 5—86 6 Claims



This invention relates to an apparatus for assisting a user thereof (particularly a person who has some disability in his

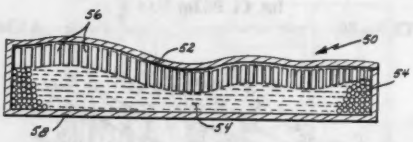
legs) to stand and comprises a framework incorporating a raisable seat member adapted to support the seat of the user, means for raising the seat member, and a knee support adapted to engage at about knee height with the legs of the user.

3,629,881
BEDRAIL FOOTREST
Esper P. Hinshaw, 402 West Georgia, Anadarko, Okla.
Filed Nov. 12, 1968, Ser. No. 774,884
Int. Cl. A47c *21/00*
U.S. Cl. 5—317 **4 Claims**



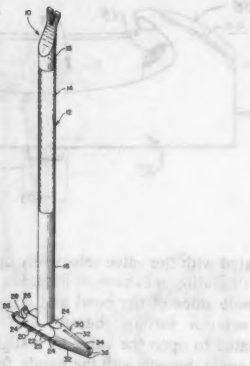
The bedrail footrest comprises a hanger member for mounting the bedrail footrest on a bedrail or the like and a footrest member, which is either rigidly secured to the hanger member or pivotally secured to the hanger member, wherein the footrest can be pivoted from a vertical storage position to a horizontal position when the footrest is to be used. In one embodiment of the invention, either member can serve as the hanger member or the footrest member depending on the type of bedrail.

3,629,882
ENERGY DISSIPATING SUPPORT DEVICE
Edward P. Thorne, Box G-D-4, 453 1st C.S.G.D, Homestead AFB, Homestead, Fla.
Original application Dec. 17, 1968, Ser. No. 784,345, now Patent No. 3,529,306. Divided and this application Feb. 11, 1970, Ser. No. 10,336
Int. Cl. A47c *27/00*
U.S. Cl. 5—345 **1 Claim**



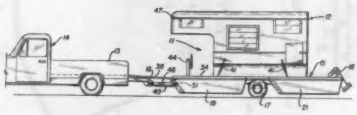
Small round pellets are confined in a given space. A series of closely fitted bars or shaped plunger units are placed in a pattern with ends flush against the pellets. The outer surface of the plungers is exposed and accepts the application of any force or blow applied thereto. Each plunger conveys its own shock to the adjacent area containing the pellets which in turn pass the shock uniformly and instantaneously to all other pellets. Each pellet absorbs an equal amount of shock and any remaining shock not wholly dissipated by the pellets is sent back in an outward force against the unaffected plunger bars.

3,629,883
BAND-BREAKING TOOL
Abraham D. Norman, 24040 Norwood Ave., Oak Park, Mich.
Filed July 28, 1970, Ser. No. 58,941
Int. Cl. B25b ; B25f *1/00*
U.S. Cl. 7—1 R **10 Claims**



A metal or plastic band-breaking tool having a band-receiving slot disposed in a plane substantially containing the axis of the handle of the tool and having a plurality of tool head pivoting edges adjacent the band slot for pivotally engaging the banded box or article, is described.

3,629,884
CAMPER-BOAT-TRAILER
Clyde A. Brown, 1080 Estes St., Lakewood, Colo.
Filed Aug. 7, 1969, Ser. No. 848,156
Int. Cl. B63c *13/00*
U.S. Cl. 9—1 T **7 Claims**

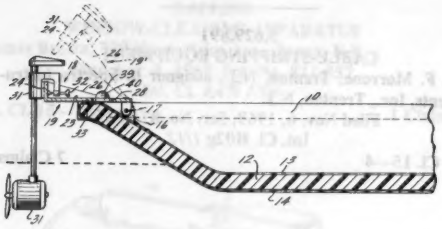


A pontoon-type boat unit adapted as a navigable support to receive and float a camper of the type normally carried by pickup trucks. The camper then protects and provides utility and living comfort for passenger occupants. On land the unit is moved in a narrow telescoped configuration as a trailer supported by wheels that are retractable for water use. Transfer of the camper from and to the truck and the boat-trailer is facilitated by roller and guide elements or alternately by truck-powered movements when the pontoons are in retracted position and camper support jacks are used. A cab-over-type camper provides shelter for an operator control station.

3,629,885
MOTOR-MOUNTING BRACKET
Ralph E. Jackson, 2250 Jane's Ln., Covington, Ky.
Filed Dec. 3, 1969, Ser. No. 881,706
Int. Cl. B63b *17/00*
U.S. Cl. 9—1 R **6 Claims**

A motor-mounting bracket for a boat having an upright platelike member at the bow and a transverse pin mounted in the platelike member which includes lugs swingably mounted

on the pin on opposite sides of the platelike member, a mounting bracket swingable with the lugs between an ex-



tended position in which an end portion of the bracket extends outwardly of the boat and a retracted position inside the boat, and a motor support on the bracket.

3,629,886

INFLATABLE SWIM APPLIANCE

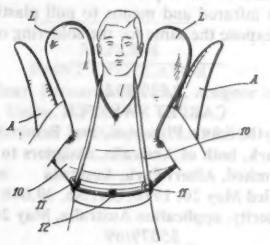
Georges A. Barnier, Parc Alexandra, Bd. Alexandre III, 06 Cannes, France

Filed Sept. 3, 1969, Ser. No. 854,858

Claims priority, application France, Sept. 4, 1968, 9406 AM

Int. Cl. B63c *9/16*

U.S. Cl. 9—336 **4 Claims**



The present invention deals with a flotation device in the form of a swim appliance which is provided with a plurality of inflatable bladder sections, which are so arranged to each other that the chest of the wearer is substantially covered by a first bladder section which is V-shaped near the neck of the wearer and is also provided with bladder extension sections which are located above the shoulders of the wearer and project upwardly therefrom and further with extension bladder sections branching out from the chest bladder section below the armpits and projecting above the shoulders at the dorsal part of the wearer. These extension sections are in communication with the interior of the chest bladder section and the extension bladder sections are shaped in a predetermined fashion in order to stabilize the wearer's swimming actions. Strap means are employed which are made of rubber and anchored at the lowest part of the chest bladder section, encircling the rear part of the neck of the wearer and lead from the anchoring locations to the dorsal part of the person having the device applied to his body.

3,629,887

CARBIDE THREAD CHASER SET

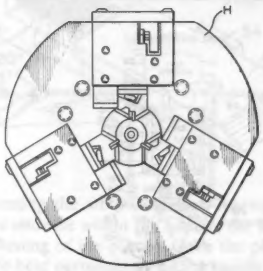
Robert F. Urbanic, Willowick, Ohio, assignor to The Pipe Machinery Company, Willowick, Ohio

Filed Dec. 22, 1969, Ser. No. 887,457

Int. Cl. B23g *1/26, 5/04*

U.S. Cl. 10—120 **9 Claims**

A set of multitooth thread chasers with their teeth shaped and arranged to perform a succession of central roughing cuts of approximately trapezoidal cross section, respectively, and of successively decrescent areas. The chasers are free from any portions which can cause flanking cuts which result in lateral flanges on the resultant chips. The cut produced by each tooth extends close to, but terminates a few thousandths of an inch short of, the flanks of two adjacent threads so that, in the final rough-cut thread, a very thin layer of metal



remains between the rough-cut thread surface and the thread finish lines, and this layer is continuous and uninterrupted along the entire final rough-cut thread surface.

This layer is removed by a single finishing tooth which makes a single finish cut concurrently cutting a portion of one crest, along the thread trough and flanks and a portion of the adjacent crest, thus cutting over a length of thread cross section equivalent to one complete thread.

3,629,888

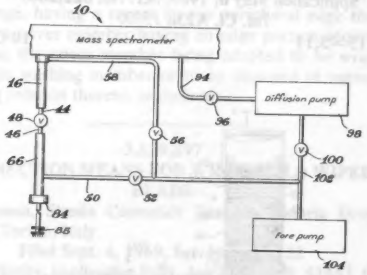
FURNACE ASSEMBLY FOR THERMAL ANALYSIS USE

Horst G. Langer, Wayland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 9, 1969, Ser. No. 856,398

Int. Cl. H05b *3/26*

U.S. Cl. 13—31 **4 Claims**



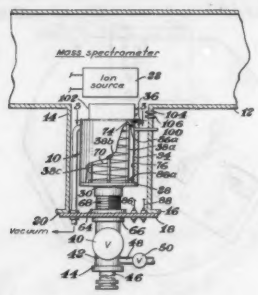
This invention relates to a heating furnace assembly which is adapted to be coupled to and become a part of a mass spectrometer adjacent to the ion source (usually) within the instrument. The furnace assembly comprises two furnaces in end-to-end relationship with sealing means between the furnaces and means for transmitting gas from one furnace to another. Each furnace is adapted to be controlled by means of temperature sensing which is adapted to be disposed within the furnace assembly.

3,629,889

FURNACE ASSEMBLY FOR THERMAL ANALYSIS USE

Horst G. Langer, Wayland, and Earl D. Ayers, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 9, 1969, Ser. No. 856,397
Int. Cl. H05b 3/26
U.S. Cl. 13—31 5 Claims



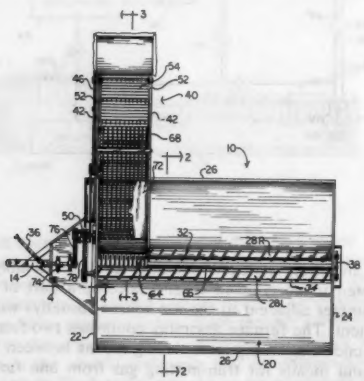
This invention relates to an enclosed heating furnace assembly which is adapted to be coupled to and become a part of a mass spectrometer adjacent to the ion source (usually) within the instrument. The furnace includes a heating device usually utilizing a helical coil and reflective surface and is adapted to be temperature controlled by means of temperature-sensing means disposed within a separate thermal analysis cell which is adapted to be disposed within the furnace. Means are provided for evacuating the interior of the furnace enclosure and for introducing gas or vapor to the furnace enclosure. Means are also provided for apertures of various sizes to open from the furnace enclosure to the mass spectrometer.

3,629,890

BEET CART

Harold D. Harris, Lubbock, Tex., assignor to Harris and Thrush Manufacturing Company, Lubbock, Tex.

Continuation-in-part of application Ser. No. 709,981, Mar. 4, 1968, now Patent No. 3,460,698, dated Aug. 12, 1969. This application May 6, 1969, Ser. No. 822,280
Int. Cl. A23n 15/00
U.S. Cl. 15—3.11 10 Claims



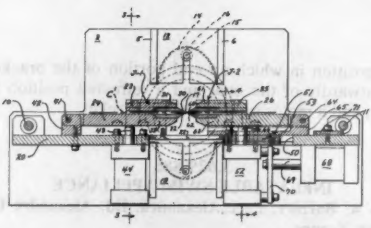
A cart receives sugar beets from a harvester while the harvester is in operation. The cart then delivers the beets for transportation to a refinery. The beets are delivered from the cart by an elevator and are cleaned in the cart as they are moved to and up the elevator.

3,629,891

CABLE-STRIPPING EQUIPMENT

Ross F. Morrone, Trenton, N.J., assignor to Spectra Instruments, Inc., Trenton, N.J.

Filed Nov. 6, 1969, Ser. No. 874,525
Int. Cl. H02g 1/12
U.S. Cl. 15—4 7 Claims



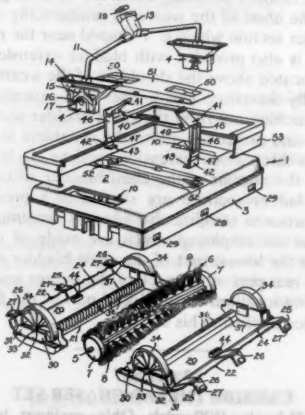
Equipment for removing insulating plastic from flat cable conductors including means to form a linelike area of infrared energy on the cable surface to vaporize the plastic thereof, jaw means to shield plastic which is to remain on the cable from the infrared and means to pull plastic along the conductors to expose the same for the soldering operation.

3,629,892

CARPET SWEEPER

Donald N. Smyth, South Plympton, and Bruce A. G. Heard, Plympton Park, both of Australia, assignors to S. A. Brush Company Limited, Albert Park, Australia

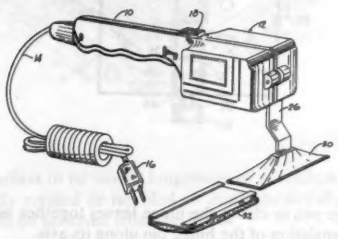
Filed May 20, 1970, Ser. No. 39,066
Claims priority, application Australia, May 26, 1969, 55579/69
Int. Cl. A47l 11/08
U.S. Cl. 15—48 12 Claims



A carpet sweeper in which the trays which receive the material swept up by a central brush are themselves hinged and carry the wheels and a comb which contacts the brush to ensure effective removal, a feature being that as the trays together with the wheels move clear of the brush for

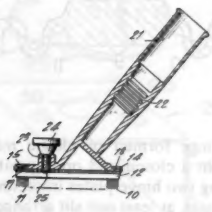
discharging of the materials much more ready and effective cleaning as well as collection of the materials is possible.

3,629,893
WINDOW-CLEANING APPARATUS
Thomas Brown, 720 Hunts Point Ave., Bronx, N.Y.
Filed Apr. 1, 1969, Ser. No. 811,857
Int. Cl. A47l *1/04*
U.S. Cl. 15—103 **1 Claim**



A portable device is provided with a pad, sponge or the like adapted to contact a window for cleaning which is connected via a linkage to an electrically operated vibrator. As the device is moved over the surface of the window to be cleaned by an operator the vibrating motion causes the pad to clean the surface.

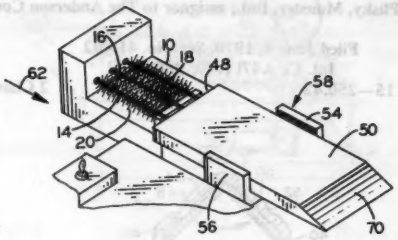
3,629,894
PAINT APPLICATOR
William W. Stefany, Bernardsville, N.J., assignor to Red Devil Incorporated, Union, N.J.
Filed Mar. 2, 1970, Ser. No. 15,584
Int. Cl. A46b *5/02*
U.S. Cl. 15—146 **3 Claims**



A paint applicator in which a paint-applying member in the nature of a pile fabric material is secured to one side of a thin flat resilient block. A rigid plate is secured to the top of the resilient block and has marginal flanges which grasp a painting guide therebetween. A handle member secured to the painting guide is provided with locking means so that the painting guide may be slid across the surface of the rigid plate and frictionally secured thereto.

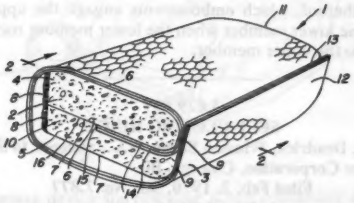
3,629,895
BRUSH FOR CLEANING KITCHEN UTENSILS AND METHOD FOR MAKING SAME
Jack Wayne Colgan, 1905 N. Tylano Blvd., New Haven, Ind.
Filed July 30, 1970, Ser. No. 59,619
Int. Cl. A46b *3/00*
U.S. Cl. 15—160 **8 Claims**

A brush is designed to clean the areas of a fork and particularly the spaces between the tines of the fork. The brush consists of a number of spaced brushes having interfitting bristles and are passed by interference fit between the tines. The bristles are vigorously passed back and forth between the tines. The bristles are held by braided stems and the stems are permanently imbedded within a thermoplastic han-



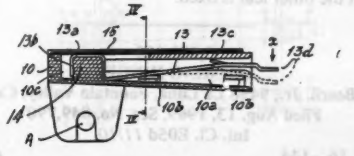
dle by first heating the stems and then inserting the stems under pressure endwise within the handle, the heat causing a temporary softening of the plastic. Once the plastic hardens the brushes are held permanently by the handle which serves to mount the brushes.

3,629,896
COMBINED WASHING, DRYING, SCRUBBING AND SCRAPING IMPLEMENT
Michael Sirnec, 1 Park Estates, Granville, Ill.
Filed Mar. 23, 1970, Ser. No. 21,943
Int. Cl. A47l *13/16, 17/08*
U.S. Cl. 15—118 **5 Claims**



A cleaning article which includes a washing member, such as a sponge, having a recess in one peripheral edge thereof and with a cover member having an edge portion secured in the recess, the cover member being adapted to be wrapped around the washing member or to be disposed in outwardly extending relation thereto, as desired.

3,629,897
CONNECTION MEANS FOR WINDSHIELD WIPER BLADE
Dario Arman, Strada Comunale Druento Venaria Druento 10040, Torino, Italy
Filed Sept. 4, 1969, Ser. No. 855,222
Claims priority, application Italy, Apr. 23, 1969, 51551 A/69
Int. Cl. A47l *1/00*
U.S. Cl. 15—250.32 **4 Claims**



A box-shaped element, attached to an oscillating, U-shaped support, releasably holds an automotive wiper blade

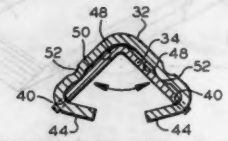
by means of a laminar plate that straddles on a retention seat formed on a box-shaped element and secured thereto by means of a hooked terminal.

3,629,898

WINDSHIELD WIPER ASSEMBLY

John J. Plisky, Munster, Ind., assignor to The Anderson Company

Filed June 1, 1970, Ser. No. 41,802
Int. Cl. A47l *1/00*; B60s *1/02*
U.S. Cl. 15—250.42 **2 Claims**



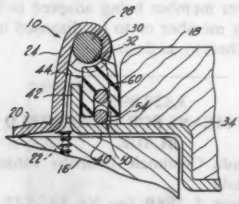
This invention relates to windshield wiper assemblies which include a wiping element and a pressure-distributing superstructure operatively connected together so as to transmit and distribute the pressure received by the pressure-distributing superstructure from the wiper arm to spaced locations along the length of the wiping element. The pressure-distributing superstructure comprises at least one lower member having an inverted V-shaped cross section and an upper member also having an inverted V-shaped cross section. The upper member is pivotally connected to the lower member by a pair of inturned tabs seated in a pair of notches in the lower member and has round embossments adjacent the inboard ends of the inturned tabs on each side of the underside thereof, which embossments engage the upper surface of the lower member when the lower member rocks with respect to the upper member.

3,629,899

SELF-CLOSING HINGE

James R. Deadrick, Winston Salem, N.C., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Feb. 2, 1970, Ser. No. 7,877
Int. Cl. E05d *11/08*
U.S. Cl. 16—142 **1 Claim**



The following specification describes a self-closing cabinet hinge having a spring-biased plastic cam follower that is camouflaged by one of the hinge leaves and also by the door to which the other leaf is fixed.

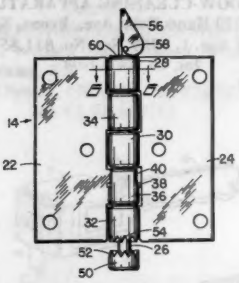
3,629,900

LOCKING HINGES

Robert Beerli, Jr., 9456 La Luna, Fountain Valley, Calif.

Filed Aug. 13, 1969, Ser. No. 849,790
Int. Cl. E05d *11/10*
U.S. Cl. 16—144 **4 Claims**

Locking hinges in which the hinge leaves or arms are locked in selected angular position against hinge action or relative rotational displacement by clamping structure utilizing the hinge pin to clamp the hinge leaves together as an incident to translation of the hinge pin along its axis.

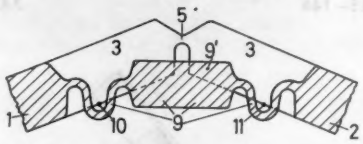


3,629,901

HINGES

Johann Alois Wolf, deceased, late of Neustadt, Germany, and Maria Hermine Wolf, administratrix, 8 Schellerstrasse, Neustadt bei Coburg, Germany, assignors to Lenox-Werk Emil Liebler & Co., Vahrendorf, Germany

Filed Apr. 29, 1969, Ser. No. 831,806 Claims priority, application Germany, Apr. 30, 1968, P 17 59 430.8
Int. Cl. E05d *9/00*
U.S. Cl. 16—150 **9 Claims**



A one-piece hinge formed of plastic material, movable about an axis from a closed and open position is disclosed, the hinge including two hinge plates interconnected by a web which lies in one axis, at least one slit arranged at right angles to the axis separating the web into two or more hung strips, one of the strips being grooved at the position of the axis, another hinge strip acting as a tension spring to bias the hinge into its closed and open positions also including a spring portion thereof having an undulating from in both the closed and open positions and displaceable about two additional axes parallel to but at points offset from the first axis.

3,629,902

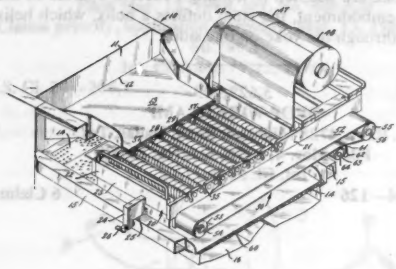
BONE AND MEAT SEPARATOR

Gordon C. Leonard, Dalton, Ga., assignor to Meat Separator Corp., Dalton, Ga.

Filed June 4, 1970, Ser. No. 43,490
Int. Cl. A22c *17/04*
U.S. Cl. 17—1 G **9 Claims**

Apparatus for separating meat from low-density bones and gristle to provide an edible food product. The apparatus includes a plurality of pairs of counterrotating rollers having helical grooves in which said rollers are spaced slightly apart to permit relatively soft meat to be pulled between the rollers

while the harder bone and gristle will not pass therethrough. The helical grooves cause the material on the upper portion



of the rollers to be moved lengthwise of the rollers and simultaneously rotated or tumbled so that substantially all of the meat will be removed from the bones.

3,629,903

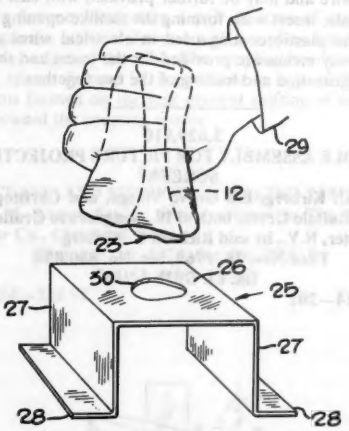
DEVICE FOR AND METHOD OF PREPARING FOWL WINGS

Nadine Turner, 101 W. Main St., Warrenton, Mo.

Filed Aug. 8, 1969, Ser. No. 848,543

Int. Cl. A22c *17/04*

U.S. Cl. 17—11 **1 Claim**



The device includes a support plate having an aperture which is compatibly configurated with the bone material of a fowl wing. By inserting the bone material of a severed wing portion into the aperture and urging the wing meat into engagement with the support plate, the meat at that end of the wing portion is pushed to the other end. Excess gristle may be removed from the bone by applying pressure to the bone material as it passes through the aperture.

3,629,904

SHRIMP-DEHEADING MACHINE

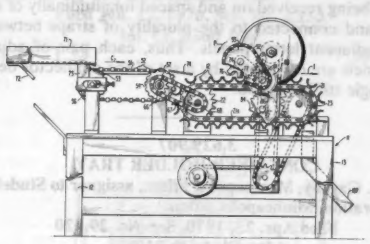
Ben P. Zober, 1364 S. Edgewater Drive, Charleston, S.C., and Arthur G. Teston, Jr., P. O. Box 181, Hollywood, S.C.

Filed Dec. 12, 1969, Ser. No. 884,463

Int. Cl. A22c *29/00*

U.S. Cl. 17—71 **5 Claims**

A shrimp-deheading machine comprising a plurality of troughlike receptacles supported in an endless row to successively receive shrimp to be deheaded and with which is associated shrimp head severing means and shrimp-retaining means movable into and out of each of the advancing recep-



tacles successively for retaining engagement with the shrimp in each receptacle as the head is severed from the shrimp by the severing means.

3,629,905

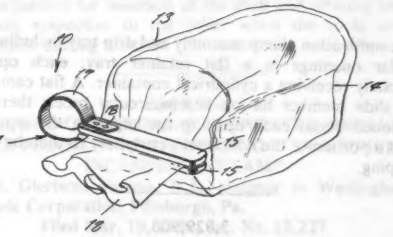
BREAD BAG RESEALER

Delmer J. Cote, 624 Arch St., New Britain, Conn.

Filed June 17, 1970, Ser. No. 47,017

Int. Cl. A44b *21/00*

U.S. Cl. 24—30.5 R **2 Claims**



A clipping device for resealing a bag containing a loaf of bread after having been opened up, the device comprising an elongated clip having flat straight jaws between which the mouth of the bag may be retained in closed position, and one end of the jaws being connected to a resilient spring member normally urging the jaws toward a pivotally closed position.

3,629,906

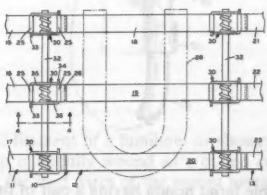
CONNECTOR DEVICE FOR AERIAL BANNER DISPLAY

Ronald Cleveland Gasser, Gasser Banners, Inc., P.O. Box 3502, Airport Station, Nashville, Tenn.

Filed Feb. 13, 1970, Ser. No. 11,101

Int. Cl. A44b *21/00*; **G09f** *21/12*

U.S. Cl. 24—81 C **5 Claims**



A connector device having substantially parallel prongs at each end. The prongs have exposed free ends for engaging

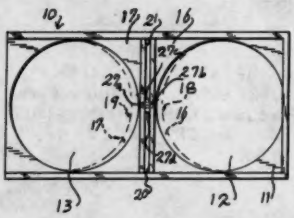
the loop ends of a pair of straps of adjacent letter panels of an aerial display banner. The connector device is also provided with means for holding a stiffening rod substantially parallel to the prongs and between the straps.

These connector devices are adapted to be used in sets, each set being received on and spaced longitudinally of a single rod and connected to the plurality of straps between a pair of adjacent letter panels. Thus, each pair of adjacent letter panels are connected by a set of the connector devices and a single stiffening rod.

3,629,907
CONTAINER HOLDER TRAY

James A. Gageby, Minneapolis, Minn., assignor to Studebaker Corporation, Minneapolis, Minn.

Filed Apr. 23, 1970, Ser. No. 29,420
Int. Cl. A44b *21/00*
U.S. Cl. 24—81 E 8 Claims

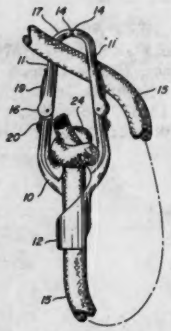


A combination clamp assembly and drip tray including two circular openings in a flat retainer tray; each opening separately receiving a cylindrical container. A flat cam-actuated slide member having a semicircular recess therein is positioned about each opening for engaging the container about a portion of the container's periphery to thereby effect clamping.

3,629,908
LARIAT HONDA

Wiley M. Phillips, 713 McLemore, Garland, Tex.

Filed June 8, 1970, Ser. No. 44,337
Int. Cl. F16g *11/00*
U.S. Cl. 24—115 F 10 Claims

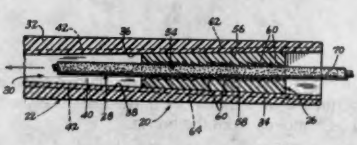


A releasable lariat honda having a pair of fingers extending from a yoke or body. At least one of the fingers is segmented and has loading means associated therewith whereby the finger tips of the honda are urged toward each other. The yoke holding the pair of fingers has a stem extending rearwardly therefrom. Said stem defines a bore which extends through the yoke and has a longitudinal axis which extends through the point of intersection of the fingertips. The stem and the yoke are adapted to holdingly receive a lariat. In the preferred embodiment, the stem defines a helix, which helix is carried through the yoke on one side.

3,629,909
DROP WIRE CLAMP

William J. Riley, 4728 Millcreek Road, Dallas, Tex.

Filed Mar. 4, 1970, Ser. No. 16,428
Int. Cl. F16g *11/02*
U.S. Cl. 24—126 6 Claims

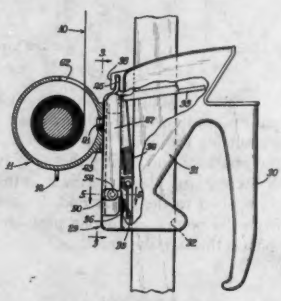


A wire clamp of plastic in which the housing is provided having a wedge-shaped slotlike opening receiving a plastic insert having a conforming wedge-shaped exterior with the housing and an elongated slotlike opening within which a wire is received with the walls forming the opening being depressable or clampable together as the wedge-shaped insert is pressed into the housing. The insert is made of plastic and may be of different sizes and forms to receive different types of wire and may be further provided with cast-in teeth in the plastic insert walls forming the slotlike opening to bear against the plastic coating used in electrical wires and the like. Keyway means are provided for the insert and the housing for registration and locking of the two together.

3,629,910
HANDLE ASSEMBLY FOR PICTURE PROJECTION SCREEN

Richard C. Kirberg, Elk Grove Village, and Christopher C. Hsiao, Buffalo Grove, both of Ill., assignors to Graflex, Inc., Rochester, N.Y., by said Richard C. Kirberg

Filed Nov. 28, 1969, Ser. No. 880,804
Int. Cl. G03b *21/56*
U.S. Cl. 24—201 1 Claim



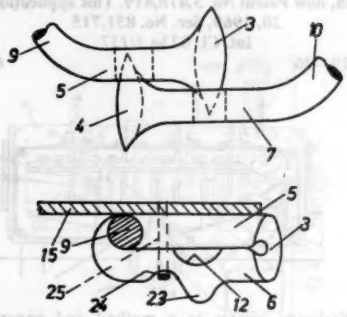
A rollup-type screen for receiving projected pictures and constructed to operate either on a floor stand or hung from a wall or ceiling. The construction includes a releasable latch mechanism between the screen roll housing and the floor stand.

3,629,911

SLIDE FASTENER

Bernd Porepp, 16 Am Rebberg, 7764 Wangen (Bodensee), Germany

Filed Mar. 12, 1969, Ser. No. 806,620
Claims priority, application Germany, Mar. 13, 1968, P 16 60 799.1
Int. Cl. A44b *19/12, 19/34*
U.S. Cl. 24—205.1 3 Claims



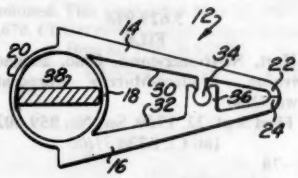
A slide fastener comprises a pair of rows of continuous links of plastic material formed with coupling heads at adjacent inner edges of the rows. The coupling heads engage in coupling spaces formed by depressions in legs of the links. Projections formed on the legs prevent shifting of mounting threads toward the coupling spaces.

3,629,912

CLAMP AND METHOD OF MAKING SAME

Edward M. Klopp, Seville, Ohio, assignor to The Chemical Rubber Co., Cleveland, Ohio

Filed Apr. 13, 1970, Ser. No. 27,817
Int. Cl. A44b *21/00*
U.S. Cl. 24—255 SL 11 Claims



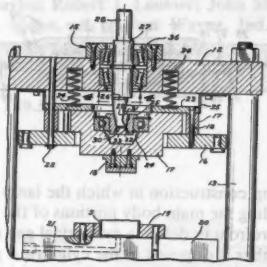
A one piece, plastic clamp formable from extruded stock. The clamp comprises a pair of lever arms merged toward one end through an integral bight portion, to form a generally U-shaped member. Releasably locking fulcrum means are positioned between the free and merged ends of the lever arms. The releasably locking fulcrum extends the full width of the clamp. The cross section of the clamp through every plane perpendicular to the extrusion axis is identical in every essential respect.

3,629,913

SHELL TRIMMER

Robert M. Gold, Minneapolis, and Thomas L. Turnquist, Prior Lake, both of Minn., assignors to Dayton Rogers Manufacturing Co., Minneapolis, Minn.

Filed Jan. 12, 1970, Ser. No. 2,153
Int. Cl. B26d *1/00*
U.S. Cl. 29—1.32 10 Claims



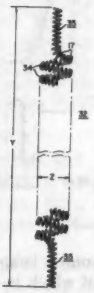
A shell trimmer removing waste material from a drawn shell wherein a pair of cooperating cutting tools fit inside and outside the drawn shell to shear the peripheral edge; tool mountings movable toward and away from each other, and a rotatable crank acting on one of the tools to align such tools when separated for insertion of the shell and orbiting one of the tools respective to the other when the tools are in cooperative cutting relation.

3,629,914

METHOD OF MAKING AN ELONGATED SINGLY COILED FILAMENT AND MOUNTING IT IN A TUBULAR INCANDESCENT LAMP

Erik N. Giertsen, Verona, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 10, 1970, Ser. No. 18,227
Int. Cl. H01j *9/18, 9/36*
U.S. Cl. 29—25.15 6 Claims



The elongated filament of a lumiline- or showcase-type incandescent lamp is initially wound as a coiled coil filament and attached to the lead wires of the mount assembly. When a getter is used, the getter is applied to the primary turns of the coiled coil filament before it is stretched and remains on the primary turns of the resulting singly coiled filament that is attached to the mount assembly.

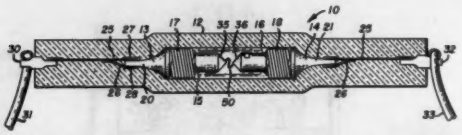
3,629,915
ARC LAMP CONSTRUCTION

Raymond E. Paquette, Saratoga, Calif., assignor to Republic National Bank of Dallas; Irving Trust Company and Union Bank

Original application Oct. 24, 1967, Ser. No. 677,565, now Patent No. 3,518,480, dated June 30, 1970. Divided and this application Oct. 13, 1969, Ser. No. 871,201

Int. Cl. H01j *9/36, 9/18*

U.S. Cl. 29—25.16 **4 Claims**



An arc lamp construction in which the lamp envelope portion surrounding the main body portions of the arc electrodes is spaced therefrom to define a cylindrical gap and in which a packing member is disposed in the cylindrical gap to support the electrodes. The packing member is elastic, or radially deformable, to prevent cracking of the envelope as the gap width changes with temperature, and is thermally conductive to allow the transfer of electrode heat across the gap to the envelope.

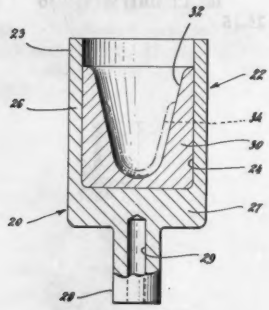
3,629,916
MAKING ALKALI METAL ALLOYS FOR CATHODE LAMPS

John W. Vollmer, Danbury, and Laurence Pellier, Westport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Original application July 27, 1967, Ser. No. 656,564, now Patent No. 3,560,790, dated Feb. 2, 1971. Divided and this application Apr. 27, 1970, Ser. No. 32,220

Int. Cl. H01j *9/02;* **C22c** *1/00*

U.S. Cl. 29—25.17 **9 Claims**



A type of spectral source lamp has a hollow cup-shaped cathode, the interior of which is coated with the spectrally emitting element or elements. A technique for forming such a coating of an alloy of an alkali metal (or metals), with, say, tin in the presence of some boron is proposed, (resulting in higher melting points and lower vapor pressures, thereby allowing higher operating lamp currents and consequent spectral radiation intensity). The coating material may be conformed directly on the interior of the cathode cup (say, of titanium) by fusing an alkali metal borohydride with tin, thereby avoiding the need to handle pure alkali metal. The hydrogen gas liberated during alloy formation removes some of the contaminants (e.g., oxides). A boron-containing, glassy slag may be readily separated from the alkali metal alloys. Specific examples in which the alkali metal component is sodium, potassium, or a mixture of sodium and potassium are disclosed. The other metal may be, for example, tin or lead.

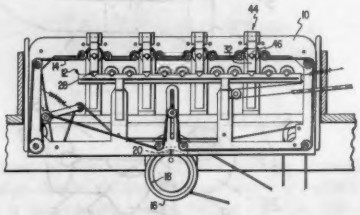
3,629,917
MACHINING CENTER EMPLOYING NON-CAPTIVE TOOLS WITH RELEASABLE HOLD-DOWN ATTACHMENT

John A. Cupler, II, 10 Cupler Drive, La Vale, Cumberland, Md.

Continuation-in-part of application Ser. No. 715,711, Mar. 25, 1968, now Patent No. 3,478,419. This application Aug. 20, 1969, Ser. No. 851,715

Int. Cl. B23q *3/157*

U.S. Cl. 29—26 **6 Claims**



The disclosure relates to a method and apparatus for rigidly restraining a noncaptive tool against transverse bodily movement during that time the tool is actually working.

A noncaptive tool is herein defined as one which may undergo bodily movement, transversely of its own axis, relative to both the tool bearing structure which accommodates the tool in working position and a tool support structure which supports the tool in a nonworking position adjacent the bearing structure. The noncaptive tool is unrestrained against the aforesaid bodily movement except during that time the tool is actually working and, while working, a rigid restraint is imposed in addition to a flexible restraint imposed by the tool driving means.

The foregoing is accomplished by the mounting of a first open bearing structure upon a tool placement rack for movement therewith during its tool interchange cycle into and out of coacting relationship with a second, fixed open bearing structure. The two open bearing structures coact in one position of the tool placement rack to provide a composite rigid bearing structure rigidly restraining transverse bodily movement of the tool journaled therein and in all other positions of the tool placement rack are maintained out of the aforesaid coacting relationship.

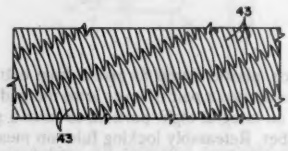
3,629,918
FILE

Lowell T. Hart, Newcomerstown, Ohio, assignor to Heller Tool Division, Wallace-Murray Corporation, Newcomerstown, Ohio

Filed Sept. 22, 1969, Ser. No. 859,802

Int. Cl. B23d *71/00*

U.S. Cl. 29—78 **15 Claims**



A file having a convex surface with a multiplicity of spaced depressions therein. At least some of the depressions are spaced from all the others and include an adjacent upset

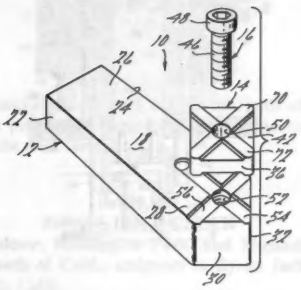
cutting lip. The surface of each of at least some of the depressions defines an arc in one plane; the arc being coextensive with the gullet of that depression; and the length of the chord from one end of the gullet to the other being greater than the width of the depression in an orthogonal plane.

3,629,919

TOOL AND TOOL HOLDER ASSEMBLY

David J. Trevarrow, Jr., 3864 Tyrconnel Trail, Orchard Lake, Mich.

Filed Sept. 17, 1969, Ser. No. 858,676
Int. Cl. B26d 1/00
U.S. Cl. 29—96 2 Claims



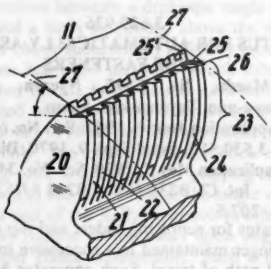
A combination tool and tool holder assembly, the tool holder member of which comprises upper and lower sides and converging edge portions which define a tool support section; a tool member adapted for operative support on the tool support section and having one or more cutting portions adapted to overlie the converging edge portions thereof so as to project outwardly therefrom for engagement with a workpiece to be machined; means for operatively securing the tool member on the tool holder member, and means for resisting rotational, transverse and longitudinal movement of the tool member relative to the tool holder member including a generally channellike recess formed on one side of one of the members and a complementary shaped embossed portion formed on the confronting side of the other of the members adapted for operative engagement with the recess.

3,629,920

GEAR CUTTER

Herbert Loos, Munich, Germany, assignor to Carl Hurth Maschinen-und Zahnradfabrik, Munich, Germany

Continuation of application Ser. No. 735,618, June 10, 1968, now abandoned. This application May 22, 1970, Ser. No. 41,670. Claims priority, application Germany, June 12, 1967, H 62978
Int. Cl. B26d 1/00
U.S. Cl. 29—103 10 Claims



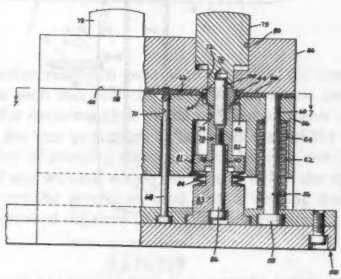
A tool for the precision working of gears by chip removal therefrom such as in gear shaving and of the type wherein the flanks of the tool teeth comprise a plurality of alternate grooves and lands having a novel cutting edge construction between the surfaces of said lands and the walls of the adjacent grooves and between the tip surfaces of the tool teeth and the land adjacent thereto. Particularly said walls and the tip surfaces adjacent thereto are provided with cutting edges for plunge shaving wherein with a given relief angle the rake angle may be positive, negative or zero.

3,629,921

METHOD OF FABRICATING A BEARING DEVICE

Gilbert E. Davies; Robert J. Loubier; John M. Weston, and Robert A. Muhn, all of Fort Wayne, Ind., assignors to Tuthill Pump Company, Chicago, Ill.

Filed Jan. 9, 1970, Ser. No. 1,733
Int. Cl. B23p 11/00
U.S. Cl. 29—149.5 B 13 Claims



The method of fabricating a bearing device comprising a housing having an opening therethrough, a ball-shaped swivel member positioned within the opening and spaced from the surface of the housing which defines the opening, and a raceway of solidified bearing material in the space between the swivel member and housing, the raceway having a swiveling clearance with and retaining said swivel member in the housing, the inner surface of the raceway being shaped to correspond to a part of an elongated sphere. In the fabrication of this bearing device, the swivel member is reciprocated relative to the housing during the hardening of liquified bearing material injected into the space between the swivel member and housing. The apparatus which accomplishes this method includes relatively moveable members which engage, respectively, the housing and the swivel member, these mold members providing the relative reciprocatory movement.

3,629,922

METAL PLATING OF PLASTICS

George T. Miller, Lewiston, N.Y., and Arabinda N. Dey, Arlington, Mass., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Mar. 23, 1967, Ser. No. 625,310
Int. Cl. B23p 3/00
U.S. Cl. 29—195 28 Claims

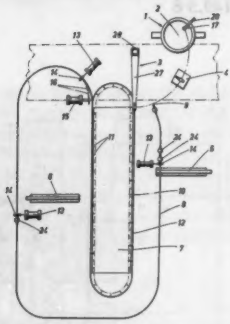
Plastics, particularly nylon, poly(haloethylene), and phenolic resins are plated with metals by pretreatment of the plastic surface with a phosphorus compound such as trihydroxymethyl phosphine in a solvent, followed by contacting the treated surface with a metal salt or complex thereof. The resulting treated surface is either conductive or is capable of catalyzing the reduction of a metal salt to produce a conductive surface. Such conductive surfaces are readily electroplated by conventional techniques.

3,629,923

INSTALLATION FOR REMOVING A STOPPER ROD FROM A LADLE, APPLYING A NEW COVERING TO SAID STOPPER ROD AND REINSERTING THE STOPPER ROD INTO THE LADLE

Erwin Kuebel; Josef Lambrecht; Alfred Linke, all of Linz, and Georg Stadlmann, Bad-Ischl, all of Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Apr. 20, 1970, Ser. No. 29,927
Claims priority, application Austria, June 6, 1969, 5304/69
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 R 14 Claims



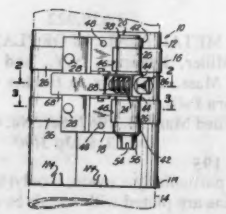
A resting place for a ladle, a knocking off station for knocking off a refractory covering from said stopper rod, a drying kiln provided with a rod-circulating device, and a receiving portion of an inclined guide leading into said drying kiln are disposed within a range in which a rod-handling device is horizontally and vertically movable. The installation further comprises adjacent to said guide a rod-straightening station and a station for applying a refractory covering to said stopper rod.

3,629,924

BAND CLAMP

Milton C. Everett, Nassau County, N.Y., assignor to Kastar, Inc., New York

Filed July 3, 1968, Ser. No. 742,206
Int. Cl. B23p *15/10*
U.S. Cl. 29—224 24 Claims



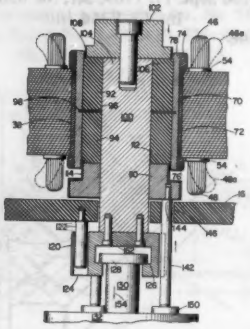
Continuously adjustable worm driven band clamp provided with rapid takeup and release particularly adapted for use as a ring compressor.

3,629,925

APPARATUS FOR COMPACTING DYNAMOELECTRIC MACHINE COILS WITH MEANS FOR PREVENTING LAMINATION DISTORTION

William N. Brown, Jr., and Robert J. Eminger, both of Fort Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Dec. 4, 1969, Ser. No. 881,977
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 D 15 Claims



Electrical surge apparatus for compacting dynamoelectric machine coils in the slots of an internally slotted, laminated stator core member and for forming the end turn portions of the coils outwardly away from the bore of the core member, which includes a resilient sleeve engaging the bore of the core and having portions extending axially outwardly beyond each end face, an expansible conductive sleeve engaging the inner surface of the resilient sleeve, a second resilient sleeve engaging the inner surface of the conductive sleeve, and a mandrel extending through and engaging the inner surface of the second resilient sleeve. A first compressing member mounted on one end of the mandrel engages one end of the second resilient sleeve and a second compressing member surrounds the mandrel and engages the other end of the second resilient sleeve. A fluid power cylinder is arranged to move the two compressing members toward each other so as to compress the second resilient sleeve therebetween thereby deforming the second resilient sleeve radially outwardly, expanding the conductive sleeve radially outwardly, and compressing the first resilient sleeve radially outwardly against the bore of the core so that the projecting portions are deformed radially outwardly respectively into engagement with the outer surfaces of the inner ends of the teeth of the respective end laminations of the core so as to prevent distortion of the teeth ends during application of the electrical surge to the field coils.

3,629,926

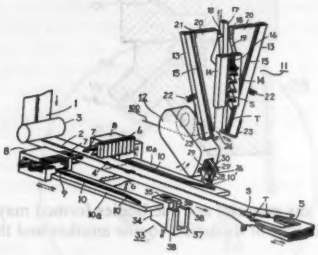
APPARATUS FOR AUTOMATICALLY ASSEMBLING SLIDE FASTENERS

Masayuki Maeda, No. 5395, Nyuzen, Nyuzen-machi, Shimonikawa-gun, Toyama-ken, Japan

Original application June 6, 1967, Ser. No. 643,875, now Patent No. 3,530,563, dated Sept. 9, 1970. Divided and this application May 5, 1970, Ser. No. 34,790
Int. Cl. B23p *19/04;* B21d *53/52*
U.S. Cl. 29—207.5 4 Claims

An apparatus for supplying sliders and top stops to a slide fastener stringer maintained in a successive movement along a horizontal path of travel. Such apparatus has in combination a pair of top stops chutes arranged in V-shape and a slider chute disposed intermediate said top stops chutes, a

parts holder having integral therewith separate nests for resiliently engaging and releasably retaining a slider and top stops delivered from their respective nests of said parts



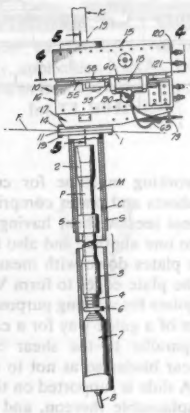
feeder and movable into and out of the path of the tape travel, and a punching means for clamping the top stops to the tapes of the slide fastener.

3,629,927

MOUSE HOLE CHUCK

Melvin J. Palmer, Huntington Park, and Michael A. Seitz, Whittier, both of Calif., assignors to Byron Jackson, Inc., Long Beach, Calif.

Filed Mar. 30, 1970, Ser. No. 23,613
Int. Cl. B23p *19/04*; B25b *21/00*
U.S. Cl. 29—240 **15 Claims**



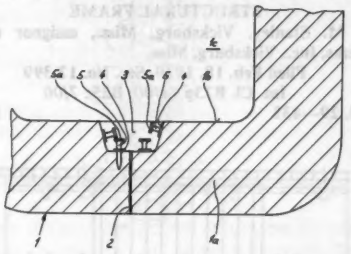
A chuck assembly for making up and breaking out threaded connections between a drill pipe single disposed in a mouse hole and a Kelly suspended above the mouse hole, in which a lower chuck subassembly is fixedly mounted at the top of the mouse hole, and an upper chuck subassembly is pivotally mounted on the lower chuck subassembly, a fluid pressure operated actuator being interconnected with the chuck subassemblies to effect pivotal movement of the upper chuck subassembly, the chuck subassemblies respectively having opposing jaws actuatable into gripping engagement with the joint part at the upper end of the single of drill pipe and at the lower end of the Kelly saver sub to effect rotation of one joint part relative to the other upon angular movement of the upper chuck subassembly. Such a mouse hole chuck in which a centering device engages the pipe to substantially center its tool joint part with respect to the axis of relative rotation of the chuck subassemblies.

3,629,928

METHOD FOR REPAIRING APPARATUS SUCH AS CHILL MOLDS

Gerhard Hammerle, Eschen Furstentum, Liechtenstein, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed July 21, 1970, Ser. No. 56,769
Claims priority, application Germany, Aug. 4, 1969, P 19 39 640.8
Int. Cl. B23b *7/04*
U.S. Cl. 29—402 **3 Claims**



This invention relates in general to a method for repairing an apparatus such as a cast chill mold and to a new and useful method for repairing chill molds wherein a groove is provided along the tear or rupture at the inner wall of the mold, and a plurality of securing elements, such as nails, are driven into the wall and secured within the groove below the surface of the wall and the groove is filled with a welding material; and to an improved repaired chill mold construction.

3,629,929

METHOD FOR MANUFACTURING COMPACTED TUBES AND RODS

Otto Wessel, Duisburg-Ungelsheim, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed July 3, 1969, Ser. No. 839,049
Claims priority, application Germany, July 9, 1968, P 17 52 757.0
Int. Cl. B23q *17/00*
U.S. Cl. 29—403 **14 Claims**

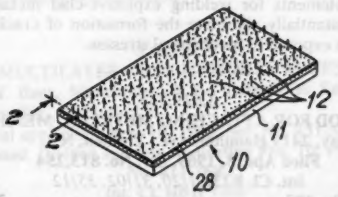
The disclosure relates to utilization of metallic shavings, usually regarded as waste. The shavings are compressed to billets and extruded. Prior to extrusion the shavings and/or the billets may be annealed. To control composition the shavings may be mixed with particular powder at selected ratios prior to compression.

3,629,930

METHOD OF MAKING A SELF-GRIPPING FASTENING DEVICE

George C. Brumlik, 154 Upper Mountain Ave., Montclair, N.J.

Original application Jan. 12, 1968, Ser. No. 697,527, now Patent No. 3,494,006. Divided and this application May 7, 1969, Ser. No. 822,656
Int. Cl. B23p *11/00*
U.S. Cl. 29—432 **6 Claims**



A self-gripping fastening device for connecting together a pair of articles, only one of which is required to be provided

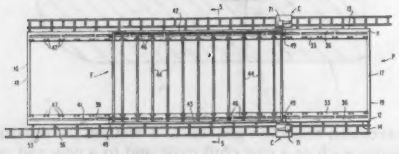
with the device, and the method for making the same. The device comprises a plurality of barbed fastening elements, each being secured at one end to one surface of one of the articles to be gripped. When the fastening device is pressed against the opposing surface of the other article to be gripped, the free ends of the fastening elements penetrate and lodge in the other article to thereby effect adhesion between the pair of articles.

3,629,931

METHOD AND APPARATUS FOR NAILING A STRUCTURAL FRAME

James M. Stanley, Vicksburg, Miss., assignor to Multi-Systems, Inc., Vicksburg, Miss.

Filed Feb. 18, 1970, Ser. No. 12,399
Int. Cl. B23p *11/00*; B25c *7/00*
U.S. Cl. 29—432 **10 Claims**



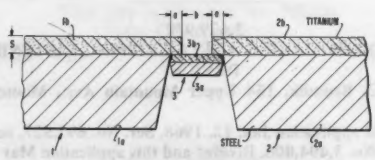
A portable jig on which is positioned a plurality of frame elements in an assembled condition with joints and which has side edges on each which a track is supported. A carriage is arranged on each of the tracks for guided movement thereon and a nailing device is supported on the carriage for positioning in nailing relationship with each of the joints in the associated edge portion of the assembled elements as the carriage is advanced on the track. The nailing device is actuated by an operator in each nailing position to nail together the frame elements in a permanent form.

3,629,932

WELDING OF EXPLOSIVE-PLATED METAL SHEETS

Ulf Richter, Wurgendorf, Germany, assignor to Dynamit Nobel AG, Troisdorf, Germany

Filed Mar. 3, 1970, Ser. No. 16,128
Claims priority, application Germany, Mar. 3, 1969, P 19 10 674.2
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.1 **7 Claims**



The present disclosure relates to a process and arrangement of elements for welding explosive-clad metal sheets which substantially eliminate the formation of cracks when the weld is exposed to mechanical stresses.

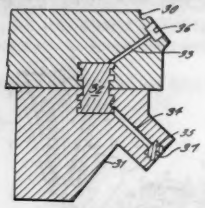
3,629,933

METHOD FOR ATTACHING METALLIC MEMBERS

Emil Sirmay, 2419 Hamilton Ave., Trenton, N.J.

Filed Apr. 3, 1969, Ser. No. 813,254
Int. Cl. B23k *1/20, 31/02, 35/12*
U.S. Cl. 29—483 **2 Claims**

Two or more bodies of metallic material have adjacent reentrant openings, the surfaces of which are roughened, and a molten metallic is poured into the cavity formed by the adjacent openings to secure the members together. The cast insert may be of any material and the bodies formed may be of any materials similar or dissimilar to one another and the cast locking insert.

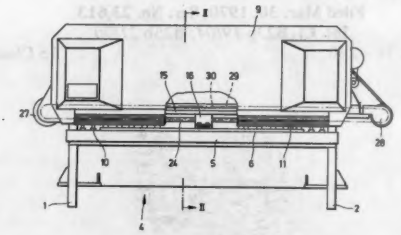


3,629,934

SHEET METAL WORKING MACHINE

Hermann Wirl, Bruchasal/Baden, Germany, assignor to Scharringhausen Maschinenbau Gesellschaft GmbH

Filed Apr. 2, 1969, Ser. No. 812,585
Claims priority, application Germany, Apr. 5, 1968, P 17 52 117.4
Int. Cl. B23p *23/00*
U.S. Cl. 29—564 **18 Claims**



A sheet metal working machine for cutting and edge-trimming of metal sheets and plates comprises the combination of a conventional seesaw shear having shear blades extending in parallel to one another and also having a pressure pad for holding the plates down with means for subsequent cutting-shaping of the plate edges to form V-, double V-, Y-, and U-formed butt joints for welding purposes.

The means consist of a guide way for a carriage, the guide way extending in parallel to the shear blades and being spaced from the shear blades so as not to obstruct the handling of the plates. A slide is supported on the carriage which slide is laterally displaceable thereon, and cutting tools are mounted on the slide.

During the cutting process the carriage idles on one side of the metal plate from where it is moved after cutting in parallel to the plate edge for shaping the plate edges to the desired form by driving means.

3,629,935

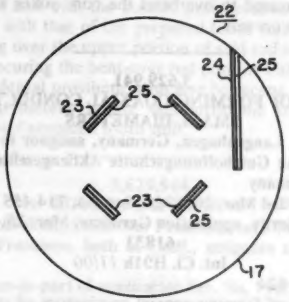
METHOD OF MAKING CAPACITOR HAVING CHORDWISE TAB-RETAINING SLIT

John W. Carino, Columbia, S.C., assignor to General Electric Company

Original application May 22, 1968, Ser. No. 731,229, now Patent No. 3,569,794. Divided and this application Jan. 29, 1970, Ser. No. 12,528
Int. Cl. H01g *9/00*
U.S. Cl. 29—570 **5 Claims**

An improved electrolytic capacitor cover is disclosed which includes inner and outer relatively rigid supporting

disc members and an intermediate disc member of a rubbery or easily sealable material. The supporting disc members contain a number of slots therein for the passage of capacitor leads therethrough, and these slots are in registry with slits in



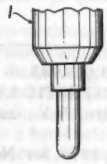
the rubbery sealing material. The inner disc member includes a chordwise slot therein in registry with a chordwise slit in the rubbery seal material. In the assembly of the capacitor a soft cathode foil tab or riser is easily passed through the chordwise slit by a slicing action therein.

3,629,936

ELECTRODE ARRANGEMENT FOR THE MEASUREMENT OF PARTIAL PRESSURES OF GASES IN LIQUIDS AND METHOD OF ITS MANUFACTURE

Karl Harnoncourt, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Dec. 22, 1969, Ser. No. 887,073
Claims priority, application Austria, Dec. 23, 1968, A 12554/68 Dec. 4, 1969, A 11343/69
Int. Cl. H01s *4/00*
U.S. Cl. 29—592 **6 Claims**



An electrode arrangement of a design for serial production and measuring the properties of individual electrodes. The measuring is carried out in a carrier of a housing with the extremity of the electrodes being sealed off in a sealing means and an electrolytic liquid being provided in a zone between two sealing means.

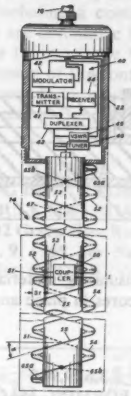
3,629,937

METHOD OF FORMING A HELICAL ANTENNA

Ake A. Fredriksson, Fullerton; F. Nicholas Fossati, Lafayette, and F. Alexander Roberts, Brea, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Original application Nov. 14, 1966, Ser. No. 593,967, now Patent No. 3,449,657, dated June 10, 1969. Divided and this application Nov. 19, 1968, Ser. No. 798,832
Int. Cl. H11p *11/00*
U.S. Cl. 29—600 **3 Claims**

The method of making an antenna wherein pairs of conducting elements are helically disposed and supported around a central conducting element and longitudinally coupled with other conductive element pairs so arranged.

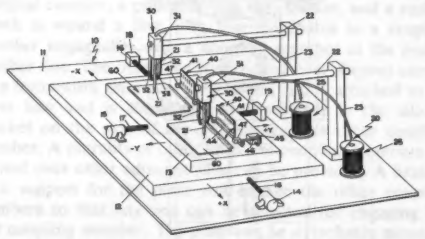


3,629,938

METHOD AND APPARATUS FOR WIRE WINDING

Gino Venturi, Ann Arbor, and John F. Stankey, Inkster, both of Mich., assignors to Sycor, Inc., Ann Arbor, Mich.

Filed Apr. 1, 1970, Ser. No. 24,500
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 **21 Claims**



Wire-wound memory devices or like articles are automatically manufactured by securing an end of the wire to a desired point on the apparatus and then drawing wire from the end of a narrow feeder tube which is held in a fixed position as a result of controlled movement of the device or article to be wired with respect to the end of the feeder tube. The device to be wired is mounted on an X–Y table for such controlled movement, and the X–Y table is moved in accordance with a program carried on and automatically read from a tape, which also is used to automatically control a soldering head and a wire-tamping apparatus so that the wire can be soldered automatically at desired points during the winding program and periodically tamped into a neat and compact winding configuration.

3,629,939

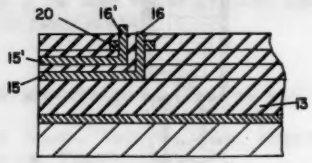
MULTILAYER CORE MEMORY PROCESS

Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Original application Feb. 10, 1965, Ser. No. 431,558, now abandoned. Divided and this application Feb. 10, 1969, Ser. No. 811,268
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 R **8 Claims**

A method of making a magnetic core matrix by selectively etching a conductive layer to form horizontal conductors

leaving vertically extending conductors over which apertured cores are disposed. The vertical conductors are then connected by deposited conductor material thereby threading



said core apertures. Insulating material is deposited where needed to secure the cores in place and/or insulate conductive areas.

3,629,940

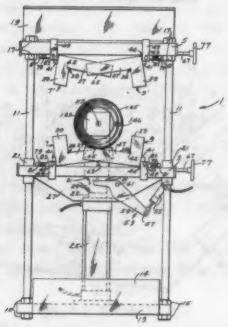
METHODS FOR FORMING MAGNETIC CORES

David F. Winter, Kirkwood, Mo., assignor to Central Transformer, Inc., Pine Bluff, Ark.

Original application July 13, 1967, Ser. No. 653,216, now Patent No. 3,535,907, dated Oct. 27, 1970. Divided and this application Feb. 2, 1970, Ser. No. 12,495

Int. Cl. H01f *7/06*

U.S. Cl. 29—609 **7 Claims**



Hydraulic press apparatus and methods for die-forming magnetic cores from a wound circular configuration to a generally rectangular configuration are described. The press is constituted by a pair of opposed relatively movable platens, each having a pair of L-shaped die bar assemblies pivotally mounted thereon and arranged so that the horizontal legs of the bars on each platen are interdigitatable and the vertical legs of the bars on one of the platens are interdigitatable with the vertical legs of the bars on the other platen, the L-bars being arranged on their respective platens so as to define an open rectangle. A corner block of chevron, curved or triangular cross section is optionally removably mounted in the inner apices of the L-bars for shaping the outside corners of the cores during the pressing operation, and a rectangular window block is insertable into and extractable from the center opening of the core by a transverse hydraulic ram thereby to form a generally rectangular core window. To form a transformer core, a circular wound loop of magnetizable material is inserted in the press between the pairs of opposed L-bars with the desired corner blocks and window form, and the lower platen is advanced toward the upper platen. The core yokes are restrained by the vertical L-bar legs to a dimension corresponding to the overall desired core length and the width of the core is determined by the core build and the width dimension of the window form. As the core is pressed, the magnetic strip is forced to assume the desired configuration in accordance with the size and configuration of the corner blocks and window form. The corner blocks may then be partially or completely removed from the corner areas, the window form reduced in thickness and the core again pressed to overbend the core yokes and sharply bend the core corners.

3,629,941

METHOD OF FORMING COAXIAL CONDUCTORS OF SMALL DIAMETERS

Rolf Wagele, Langenhagen, Germany, assignor to Kabel-und Metallwerke Gutehoffnungschutte Aktiengesellschaft, Hannover, Germany

Filed Mar. 20, 1968, Ser. No. 714,455

Claims priority, application Germany, Mar. 25, 1967, K 61833

Int. Cl. H01h *11/00*

U.S. Cl. 29—624 **3 Claims**

A method of forming coaxial conductors of small diameters.

3,629,942

GRASS TRIMMER

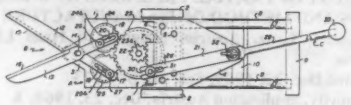
Joseph Leo Guay, 169 Maplewood Ave., Hamilton, Ontario, Canada

Filed Feb. 5, 1970, Ser. No. 8,956

Claims priority, application Canada, Feb. 6, 1969, 042,199

Int. Cl. B26b *13/00*

U.S. Cl. 30—248 **2 Claims**



A grass trimmer having a wheeled framework with shears projecting forwardly therefrom, gearing associated with the shears for actuating the shears rapidly as the gearing is operated slowly and manually operated means for operating the gearing.

3,629,943

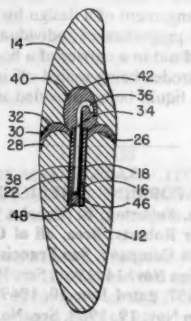
DENTAL PROSTHETIC ASSEMBLY

Abraham Gindea, Brooklyn, N.Y., assignor to Whaledent, Inc., Brooklyn, N.Y.

Filed July 13, 1970, Ser. No. 54,105

Int. Cl. A61c *5/08*

U.S. Cl. 32—13 **11 Claims**



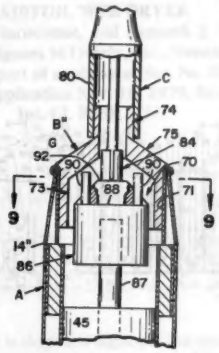
Apparatus and method for securing a dental prosthetic structure, such as a false tooth, to a patient's tooth stub and

comprising the drilling of a bore in the tooth stub, inserting a preformed hollow sleeve having a closed distal end and an open proximal end in the bore so drilled, inserting the lower end portion of an intermediate rod member within the opening in said sleeve to frictionally secure the same therein forming a dental prosthetic structure with an opening in the bottom thereof and with the bottom peripheral surface thereof conformed with that of the prepared tooth stub or jawbone, and bending over the upper portion of said rod member upon itself and securing the bent-over rod portion within the opening in said dental prosthetic structure by means of a self-curing resin to thereby secure said prosthetic structure with respect to said prepared tooth stub.

3,629,944
ROTARY IMPLEMENT

Edward A. Avakoff, South San Francisco, and Oliver G. Harris, San Francisco, both of Calif., assignors to Lord Corporation

Continuation-in-part of application Ser. No. 796,739, Feb. 5, 1969, now abandoned. This application June 17, 1969, Ser. No. 839,774
Int. Cl. A61c *17/00*
U.S. Cl. 32—59 **3 Claims**

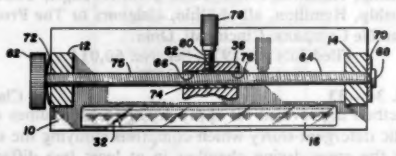


A portable rotary cup toothbrush in which a contraangle is affixed to a hand-held motor and has the rotary power of the motor communicated therethrough to power a rotating cup or buffer for removing the bacterial plaque from the teeth of the user. An adapter is disclosed which will couple a standard dentist's contraangle to a hand-held motor. Additionally, the coupling between the motor on one hand and the contraangle on the other hand is provided with a flywheel for the storage of rotational energy.

3,629,945
OPTICAL GAGE

John C. Liuzzo, and Helmut Welker, both of Jamestown, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 6, 1969, Ser. No. 863,882
Int. Cl. G01d *3/04*
U.S. Cl. 33—107 R **9 Claims**

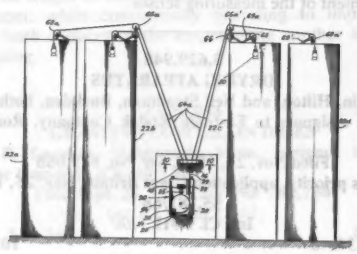


A gage for linear measurement of a workpiece comprises an optical assembly for viewing a linear scale placed for reading upon the workpiece, both the scale and the observed portion of the workpiece being at the same focal length. The optical assembly is slidable either by manual operation or by a control mechanism including a control shaft having spiral grooves which which are diminutive in depth which journal within, for example a thermoplastic bushing housed by the optical assembly. Rotation of the control shaft about its axis causes the optical assembly to traverse along the length of the scale. The optical assembly is also slidably translatable.

3,629,946
LEVEL MEASURING DEVICE FOR A CONTAINER OF BULK MATERIAL

Ward H. Parsons, 1202 Green Glen Road, Birmingham, Ala.

Filed Oct. 9, 1969, Ser. No. 866,431
Int. Cl. G01b *3/00*
U.S. Cl. 33—126.5 **9 Claims**

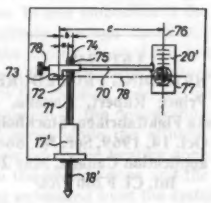


A measuring device comprises a plate on which is mounted a digital counter, a pulley driving the counter, and a reel on which is wound a line. The line terminates in a coupling member engageable with a coupling member at the end of another line. The other line is entrained over sheaves carried by a framework on a silo. A weighted bell is attached to the other line and is suspended over material in the silo. A bracket on the side of the silo engages the other coupling member. A plurality of other lines and coupling members entrained over other adjacent silos can be provided. A bracket on a support for the plate will engage the other coupling members so that any one can be selected for engaging the first coupling member. The plate can be detachable mounted on the support for removal and mounting on another remote support.

3,629,947
APPARATUS FOR MEASURING LENGTHS

Johann Meier, Casa Clarissa, Brione s.M., Switzerland

Filed July 9, 1969, Ser. No. 840,386
Claims priority, application Switzerland, July 15, 1968, 10523/68
Int. Cl. G01b *5/02*
U.S. Cl. 33—147 E **5 Claims**



A novel apparatus for measuring lengths is disclosed, the apparatus comprising a measuring sensor displaceable in its

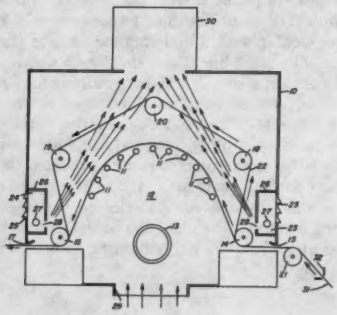
longitudinal direction. An optically transparent projection scale provided with measuring marks is coupled for movement with the measuring sensor and is displaceable in the same direction thereof. An illumination means is disposed on one side of the projection scale and a projection lens is disposed on the other side thereof. A mirror system is provided and is generally disposed on the same side of the projection scale as is the projection lens. Specifically, a first mirror is disposed in the light path from the projection lens so as to deflect the light beam about a first axis from the projection lens or objective. A second mirror is disposed in the light path of the light beam deflected from the first mirror so as to deflect the light beam about a second axis parallel to the light beam emerging from the projection objective. A third mirror is provided for deflecting the light beam from the second mirror about the a third axis parallel to the second axis. Finally, the novel apparatus includes a multiportion reading scale upon which the measuring marks of the projection scale are projected, the reading scale being disposed transversely to the projection scale and thus transversely to the direction of movement of the measuring sensor.

3,629,948

DRYING APPARATUS

Eric Wain, Hilton, and Neil Steadman, Buckden, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,068
Claims priority, application Great Britain, Nov. 25, 1968, 55,781/68
Int. Cl. B01k *5/00*
U.S. Cl. 34—1 **10 Claims**



A dryer, for drying moisture-containing webs, comprises a stray-field platen defined by a plurality of radio frequency electrodes arranged substantially on an arc and defining a path for a web to be dried, feed means for initially feeding a web to be dried through the dryer and extending along a path remote from the platen and additional heating means for initially directing a jet of a warm gas such as air on to the web to be dried.

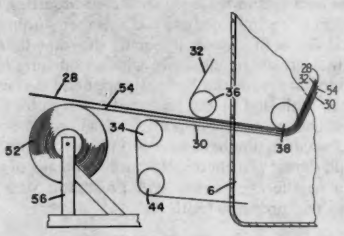
3,629,949

THREADING PROCEDURE

Harry Knelson, Prince Rupert, Canada, assignor to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

Filed Oct. 14, 1969, Ser. No. 866,350
Claims priority, application Canada, May 26, 1969, 52,511
Int. Cl. F26b *3/00*
U.S. Cl. 34—23 **3 Claims**

Two contiguous conveyor belts for threading a pulp web tail through a dryer to avoid bunching and consequent tearing or cutting of the web tail by means of a paper tape such as those found on adding machines between the web and one belt. The paper tape allows relative slippage between one



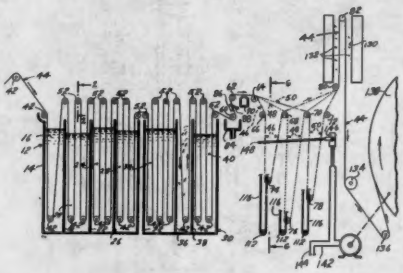
belt and the web tail so that the web does not have to try to conform with the local speed differences between the belts as they pass successively through direction reversing rolls.

3,629,950

METHOD AND APPARATUS FOR DRIVING AND DRYING MULTIPLE STRANDS

Leonard H. Tall, 6308 S.E. 22nd, Mercer Island, Wash.

Filed Oct. 27, 1969, Ser. No. 869,743
Int. Cl. F26b *3/04*
U.S. Cl. 34—23 **11 Claims**



This invention is directed to a tendency drive unit for continuously processing and advancing a plurality of strips of photographic prints.

These strips of photographic prints are run through developing solutions and are in contact with liquids. Then, after being developed, it is necessary to dry these strips of photographic prints. In the drying of the strips and due to the mechanical variations in the rollers and the drying components and the fact that strips do not significantly expand and contract, the strips tend to wander on the rollers and to become entangled with one another. As a result, the strips are not advanced, the prints are not developed and the processing of the prints is hindered, and, possibly, stopped.

The following disclosure is for a method and apparatus for compensating for the mechanical variations in the rollers and the drying components.

3,629,951

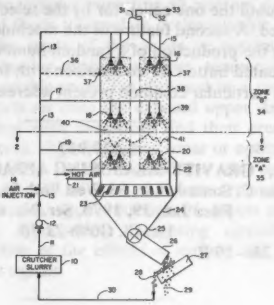
MULTILEVEL SPRAY-DRYING METHOD

Robert P. Davis, Cincinnati; Michael S. Haines, Springfield Township, Hamilton County, and John A. Sagel, Colerain Township, Hamilton, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 31, 1970, Ser. No. 60,011
Int. Cl. F26b *3/00*
U.S. Cl. 34—33 **10 Claims**

A method is provided for spray-drying large volumes of a synthetic detergent slurry which comprises spraying the slurry into the spray-drying chamber in at least two different levels of uniformly spaced atomizing nozzles. The lowest

level of nozzles is critically positioned at a point in the spray chamber below a 190° F. isotherm and above a boiling point isotherm. From 30 to 80 percent of the slurry is atomized at



this lowest level. The balance of the same slurry is sprayed through the remaining levels. Apparatus is provided for practicing this process.

3,629,952

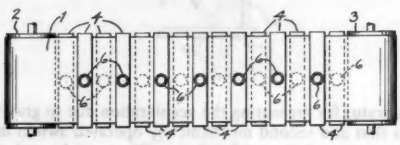
AIRFOIL WEB DRYER

Wm. F. Overly, Winneconne, and Kenneth J. Pagel, Neenah, both of Wis., assignors to Overly, Inc., Neenah, Wis.

Continuation-in-part of application Ser. No. 817,834, Apr. 21, 1969. This application Nov. 16, 1970, Ser. No. 89,744

Int. Cl. B65h *17/32*

U.S. Cl. 34—156 **2 Claims**



An airfoil nozzle is disposed adjacent the moving web to be dried and is constructed with a substantially flat planular guide surface trailing the nozzle, facing the web and substantially parallel thereto.

3,629,953

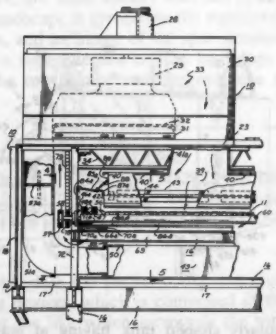
MATERIAL DRYING APPARATUS

Myron T. Fleming, Maple Glen, Pa., assignor to Lansdowne Steel & Iron Company, Morton, Pa.

Filed Sept. 22, 1970, Ser. No. 74,332

Int. Cl. F25b *13/00*

U.S. Cl. 34—158 **10 Claims**



A material drying apparatus particularly intended for drying carpeting dyed by a wet process, the apparatus comprising a housing and means for continuously moving the carpeting along a predetermined path through the housing. The apparatus further includes a plurality of air conditioning and driving means for drawing air from the interior of the housing, heating it, and channelling it into upper and lower plenum chambers located on opposed sides of the carpeting. The apparatus may be selected to impinge heated air from each of the plenum chambers against opposed sides of the carpet for subsequent recirculation without passing therethrough or alternatively may be selected to drive air from one of the chambers through the carpeting. The air is driven through the carpet by means of a baffle system which extends or enlarges one of the plenum chambers into substantially airtight communication with one side of the carpet. Additional baffle means are provided to maintain the airtight communication between the carpet and the plenum chamber as the support means for the carpeting is moved to accommodate carpets of various widths. The baffle system also incorporates a wall system for permitting the dryer to operate along one length of the housing to drive heated air through the carpet, while concurrently operating to impinge air against both surfaces of the carpet along another length of the housing.

3,629,954

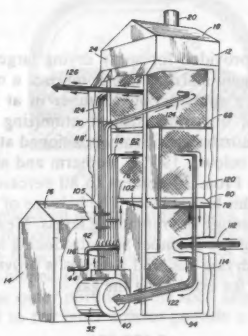
GRAVITY FLOW GRAIN DRIES

James P. Lavalier, Mahtomedi, Minn., assignor to Hart-Carter Company, Chicago, Ill.

Filed Sept. 26, 1968, Ser. No. 762,750

Int. Cl. F26b *17/12*

U.S. Cl. 34—167 **6 Claims**



The disclosure describes a dryer for granular material provided with first and second successive zones to treat the material with heated gas under dehydrating conditions and a third zone connected therewith wherein the material is treated with incoming cool gas, characterized by passageways to conduct the flow of gas in opposite directions transversely through the first and second zones and means to combine the effluent gases from the second and third drying zones and supply heat thereto to form the heated gases used in the first and second zones. In one embodiment the granular material is passed successively through the first, second and third treating zones, the supply of cool gas is conveyed into the third zone to cool the dehydrated material therein, the effluent gases from the cooling zone are passed to a heating zone to form a portion of the dehydrating gas passed to the first and second zones while the effluent from the second zone is being recycled to the heating zone to be mixed with the effluent from the cooling zone and the effluent from the first zone is being exhausted from the system. In another embodiment the granular material is passed downwardly by gravity through perforated columns arranged in a vertical substantially parallel relationship, and a baffle system surrounds the columns to provide a division of the heated treating gas, between the first and second zones, whereby a por-

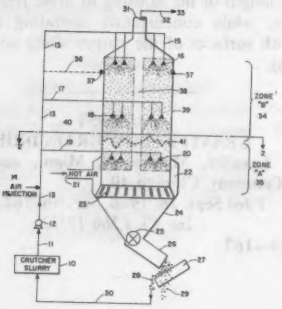
tion of the gas is directed outwardly from between the columns in the second zone and then recirculated while the remainder of the gas is directed inwardly through the perforated columns of the first zone from which it is discharged as the effluent from the system. Other embodiments are disclosed including means to control the volume of recycled effluent from the second treating zone, e.g., the proportion of moisture laden gas sent to the heating zone for recirculation.

3,629,955

MULTILEVEL SPRAY-DRYING APPARATUS

Robert P. Davis, Cincinnati; Michael S. Haines, Springfield Township, Hamilton County, and John A. Sagel, Colerain Township, Hamilton County, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 31, 1970, Ser. No. 60,012
Int. Cl. F26b *17/12*
U.S. Cl. 34—174 **3 Claims**



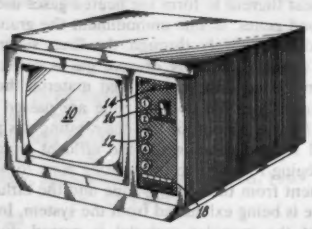
A means is provided for spray drying large volumes of a synthetic detergent slurry which comprises a means spraying the slurry into a spray-drying chamber in at least two different levels of uniformly spaced atomizing nozzles. The lowest level of nozzles is critically positioned at a point in the spray chamber below a 190° F. isotherm and above a boiling point isotherm. From 30 percent to 80 percent of the slurry is atomized at this lowest level. The balance of the same slurry is sprayed through the remaining levels. Means is provided at the bottom of the chamber for introducing a cyclonic current of heated drying gas, and a means is provided at the top of the chamber for exhausting the gas.

3,629,956

TEACHING AND GAME PLAYING MACHINE

Lucius Ponder Thomas; James Alexander McDonald; Eugene Ernst Janson; Todd J. Christopher, and John Charles Peer, all of Indianapolis, Ind., assignors to RCA Corporation

Filed Aug. 4, 1970, Ser. No. 60,866
Int. Cl. G09b *7/08*
U.S. Cl. 35—9 A **4 Claims**



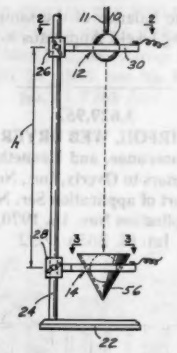
Frames on a film may contain multiple choice questions which can be answered by selecting one of a number of answer buttons but each frame includes only a single next address code. The latter has only a small number of bits but is ambiguous in the sense that the present address on a number of frames is equal to this next address. The ambiguity is resolved by counting the frames having this common present address until the one called for by the selected answer button is reached. A second feature of the machine useful in playing games is the production of a random number in response to a user actuated button for comparison with the count of frames having a particular common present address.

3,629,957

GRAVITY-MEASURING APPARATUS

Saligrama C. Somashekar, 55 West 76th St., New York, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,708
Int. Cl. G09b *23/10*
U.S. Cl. 35—19 R **6 Claims**



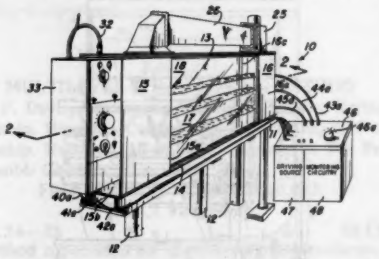
Apparatus for measuring the acceleration due to gravity includes first and second mechanically operated switch means positioned one below the other on an upright rod. Each switch means is opened or closed in accordance with whether the switch means supports a ball which freely falls from the upper to the lower switch means. Both of the switch means are in a series circuit which includes an electrically operated timer.

3,629,958

INTERNAL AND SURFACE WAVE SIMULATOR TANK

Jack R. Olson, San Diego, and Henry M. Miller, Jr., Lakeside, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Mar. 6, 1969, Ser. No. 804,866
Int. Cl. G09b *23/12*
U.S. Cl. 35—19 **5 Claims**



A rectangularly shaped tank having at least one transparent wall is partially filled with fluids having discrete

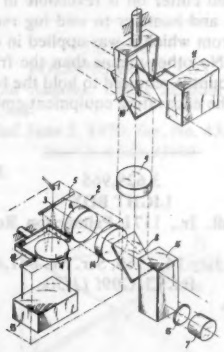
specific gravities to ensure a stratified separation of the fluids within the tank. A visual observation of this separation is aided by dyeing the fluids different colors. A reciprocating vane or bellows is suspended in the liquid and, via an appropriate driving mechanism, is reciprocated at various frequencies and magnitudes imparting an internal wave motion to the layered fluids to simulate oceanographic internal waves found in the strata of the ocean as determined by volumes of water having distinct salinities, temperatures, or currents, etc. A variable-speed fan disposed in a recirculating-air system impels air onto the exposed upper surface of the fluids simulating wind conditions and their creation of various surface waves. High-frequency sonar or optical beam forming and receiving device transducers are optionally mounted at opposite ends of the tanks in the separate layers to transmit and receive signals through the layers and thus provide, through appropriate monitoring circuitry and devices, an indication of the effects of surface and internal wave action on the signals.

3,629,959

METHOD OF AND SYSTEM FOR TRAINING IN FIRING GUIDED MISSILES FROM A MOBILE PLATFORM

Georges Colin, Essonne, and Pierre de Guillenchmidt, Hauts-de-Seine, both of France, assignors to Giravions Dorand, Suresnes, France

Filed Dec. 16, 1968, Ser. No. 783,889
Claims priority, application France, Feb. 16, 1968, 140097
Int. Cl. F41g *3/26*; G09b *9/00*
U.S. Cl. 35—25 **9 Claims**



In a method of and device for training in firing guided missiles from a mobile platform, both a device for generating a spot simulating a trace of the missile, and the eyepiece of an aiming device, are made unitary with said platform, an image of the real landscape is gyroscopically stabilized in relation to the platform, and an image of the spot simulating a trace of the missile is superimposed on the landscape image by introducing the spot image into the eyepiece of the aiming device.

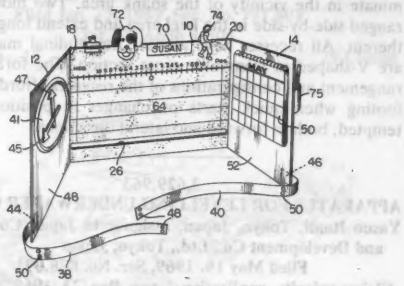
3,629,960

REMOVABLE COMPARTMENT FOR DESK TOP

Marjorie P. Roush, 2340 College Ave., Huntington, Ind.

Filed Dec. 17, 1969, Ser. No. 885,869
Int. Cl. A47b *41/00*
U.S. Cl. 35—60 **5 Claims**

A removable desk top packet containing multiple learning and teaching devices, which is comprised of three panels of cardboard or the like which surrounds the top of the desk, the middle panel being slotted to receive an edge of the desk to hold the panels in an upright position, and a buckle draws the two side panels together against the sides of the desk in order to form an enclosure at the desk so that each student



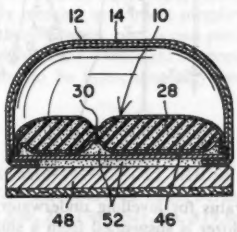
can see and handle and work with learning and teaching aids which are available for mounting on the interior sidewalls and exterior walls of the panels.

3,629,961

SHOE CONSTRUCTION INCORPORATING CUSHIONED SOCK LINING

Josef Seif, 63-36 Bourton St., Rego Park, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,346
Int. Cl. A43b *9/00*
U.S. Cl. 36—2.5 R **8 Claims**



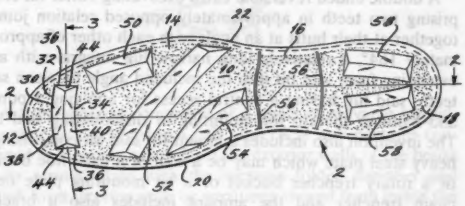
A shoe construction incorporating a sock lining filled with a cushioning material. The lining covering the upper inner surface of the shoe is sewn along its outer periphery to the edges of a cushioned sock lining. An inner sole is adhesively attached to the outer portion of the sock lining and an outer sole is affixed to the inner sole to provide a firm outer surface.

3,629,962

SHOE OUTSOLE

Louis C. Brock, 9716 Bonhomme Estates Drive, Olivette, Mo.

Filed Mar. 4, 1970, Ser. No. 16,364
Int. Cl. A43b *13/00*
U.S. Cl. 36—59 C **9 Claims**



An outsole has a generally flat ground-engaging surface and elongated recesses projecting upwardly into the sole

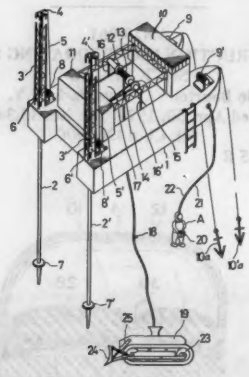
proper from the ground-engaging surface. One recess extends transversely across the toe area of the sole. Another extends longitudinally along the outer side of the sole in the ball area. Still others extend obliquely through the ball area and terminate in the vicinity of the shank area. Two more are arranged side-by-side in the heel area and extend longitudinally therein. All recesses have arcuate longitudinal margins and are V-shaped in transverse cross section. The foregoing arrangement and configurations of the recesses afford excellent footing when quick starts or changes in position are attempted, both in forward and lateral directions.

3,629,963

APPARATUS FOR LEVELLING UNDERWATER GROUND

Yasuo Itami, Tokyo, Japan, assignor to Japan Construction and Development Co., Ltd., Tokyo, Japan

Filed May 19, 1969, Ser. No. 828,091
Claims priority, application Japan, Dec. 23, 1968, 43/94681
Int. Cl. E02f 5/00
U.S. Cl. 37—54 **1 Claim**



In an apparatus for levelling underwater ground, an underwater bulldozer is suspended from a ship by means of a cable, and a diver is lowered near the bulldozer to remotely manipulate the bulldozer by operating a control panel carried by him. Electric signals from the control panel are supplied to the bulldozer via an electric cable. The ship is provided with a cavity to accommodate the bulldozer, a winch to raise and lower the bulldozer and retractable bulldozer-supporting means.

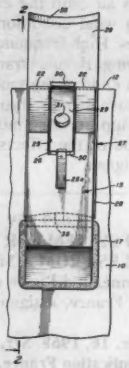
3,629,964

EARTH EXCAVATING CUTTING BIT AND MOUNT THEREFOR

James C. Russel, Route 2, Box 742, Yakima, Wash.

Filed Aug. 11, 1969, Ser. No. 848,870
Int. Cl. E02f 9/28
U.S. Cl. 37—141 T **3 Claims**

A double ended reversible earth excavating cutter bit comprising two teeth in approximately opposed relation joined together at their butts at an angle with each other of approximately 164°, a relatively long narrow lug integral with and extending from said bit into the included angle between said teeth, said lug having a central recess for applying a punch and hammer thereto for mounting or dismounting said bit. The invention also includes a mount for said bit comprising a heavy steel plate which may be a wall of a back hoe bucket or a rotary trencher bucket or a bit mounting plate on a chain trencher and the amount includes also a bracket welded to said plate and terminating approximately flush with the leading edge of said plate and spaced from said plate for most of its length to form a long tapered open ended slot between the bracket and said plate, each of the teeth on the opposite ends of said bit being also tapered alike to fit snugly the tapered slot between said bracket and said plate. The bracket has a slot in its outer end which opens into said tapered slot for snugly receiving said lug when a punch is applied to the central recess in said lug and a hammer applied to said punch to drive one of the teeth of said bit into the tapered slot between said bracket and said plate. The lug receiving slot in the end of said bracket has a depth which



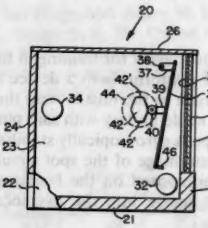
will be reached by said lug only after said tooth has been driven very tightly into the tapered slot between said bracket and said plate. Said cutter bit is reversible in said mount by applying a punch and hammer to said lug recess in the opposite direction from which it was applied in driving said bit into said mount. No other means than the friction between the bit and the mount is required to hold the bit in place during operation of the excavating equipment embodying the invention.

3,629,965

LIGHT BOX

William A. Heindl, Jr., 1171 Palmerston Road, Rochester, N.Y.

Filed July 14, 1969, Ser. No. 841,440
Int. Cl. G09f 11/30
U.S. Cl. 40—63 A **2 Claims**



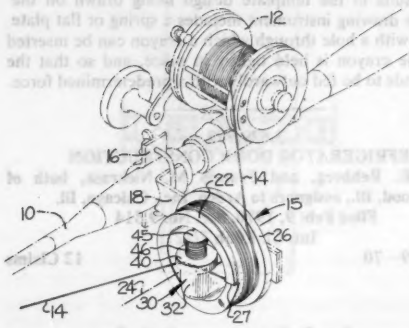
A conventional transparency is removably mounted in an opening in the front of a box containing a translucent shade, which is mounted to pivot about its upper edge toward and away from the transparency, and to closed and open positions, respectively. A first lamp adjacent the lower edge of the shade illuminates the transparency when the shade is in its open position, and a second lamp rearward of the shade may be energized to superimpose an image of the shade onto the transparency, when the shade is closed. Two such shades pivoted relative to one another may be mounted in the box as an alternate construction.

3,629,966

FISHING LINE STORAGE AND RELEASE DEVICE

Venancio D. Sanchez, P.O. Box 1544, Charlotte, N.C.

Filed May 22, 1970, Ser. No. 39,933
Int. Cl. A01k *97/00*
U.S. Cl. 43—25 10 Claims



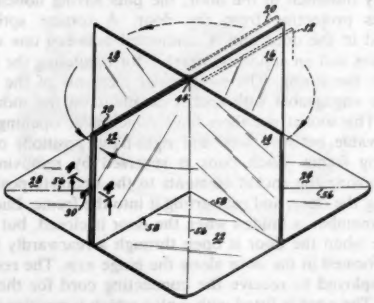
A line storage device for use with a fishing rod or the like and which is designed to store a predetermined length of line in front of the reel. The device includes a releasable guide element for releasing the line as slack upon the application of a predetermined tension on the line as would occur when a fish strikes the bait.

3,629,967

FOLDING BOOK TOY

Sidney Bass, Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed June 5, 1970, Ser. No. 43,745
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 L 12 Claims



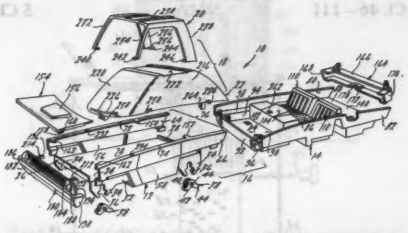
A booklike toy which can be opened to display up to four different stage settings, each setting including a pair of walls at right angles and a floor. The toy is formed from a single sheet of thin cardboard formed with a plurality of successive page portions positioned in a row and separated by folding lines for folding, accordion style, into a book. The sheet also includes platform portions, each extending laterally from a page portion, a pair of adjacent platform portions glued together in a lap joint so they lie taut when the adjacent pages are opened to a 90° angle. The sheet also includes a pair of cover portions with a spine strip between them, the first and second cover portions respectively glued to a first and last of the pages to create a hard-cover book appearance.

3,629,968

TOY VEHICLE

Robert S. Linstead, Rockford, Ill., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed Jan. 17, 1969, Ser. No. 791,889
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 29 Claims



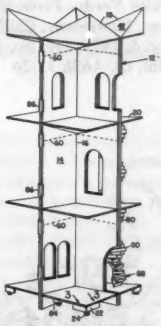
A toy vehicle including a body assembly comprising a generally U-shaped body member including a lower base section and laterally spaced upstanding side sections providing front and rear fenders and an access door along each side of the vehicle, an insert member having a lateral dimension approximately equal to the lateral spacing between the side sections and a longitudinal dimension approximately equal to the length of the body member and providing an engine compartment, an operator and passenger compartment and a luggage compartment interiorly of the body member, means for securing the body member and insert member against relative movement therebetween, and a one-piece transversely extending generally upright windshield element and a top subassembly adapted to be interchangeably mounted on the body assembly.

3,629,969

SEGMENTED MODEL HOUSE

Bruce C. Dodd, 745 Santa Barbara Road, Berkeley, Calif.

Filed Apr. 28, 1969, Ser. No. 819,849
Int. Cl. A63h *33/16*
U.S. Cl. 46—21 7 Claims

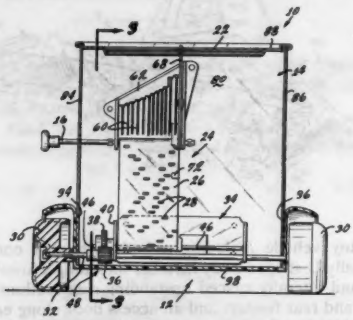


A toy dollhouse comprised of a series of movable hinged-together sections having a pair of vertical wall portions connected at a corner which form the exterior walls of the house in its normal state with the sections folded together and which form interior walls or partitions viewed from inside the house when the sections are folded outwardly in various positions, thereby exposing and providing access to the house interior. Each house section may include a series of floor members supported on its vertical wall portions in addition to top and bottom members.

3,629,970
PULL TOY

William R. Baynes, Palos Verdes Peninsula; Thomas G. Frickanisce, Hawthorne; William Hart, Torrance; Andrew M. Holland, Santa Monica, and Joseph P. Morris, Huntington Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 20, 1970, Ser. No. 12,946
Int. Cl. A63h *5/00*
U.S. Cl. 46—111 **5 Claims**

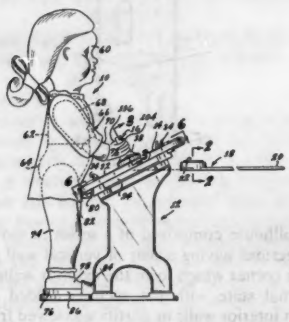


A musical jack-in-the-box toy which can be operated by pulling it along the ground or by turning a handle, comprising a sheet metal box on a molded plastic carriage. The carriage has walls that form a recess for receiving the sheet metal box, while the box has sidewalls but no bottom wall. In order to prevent inward buckling of the box sidewalls, a bottom wall of the carriage has pins to push the box walls outwardly against the carriage sidewalls. A clutch for coupling the carriage wheels to the music mechanism includes an integral pawl member with a hub and pawls joined by a thin section of material which acts as a hinge.

3,629,971
DRAWING DOLL ASSEMBLY

Earl O. Antell, Gardena; Jack L. Barcus, Cerritos; Gregory M. Gunther, Palos Verdes Peninsula; Warren D. Kabot, Torrance; J. Stephen Lewis, Pacific Palisades; Donald J. Maurer, Torrance; Richard L. May; Brian G. Osborne, both of Manhattan Beach; John W. Ryan, Los Angeles, and Floyd E. Schlau, Palos Verdes Peninsula, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Mar. 4, 1970, Ser. No. 16,450
Int. Cl. A63h *33/26*
U.S. Cl. 46—240 **12 Claims**

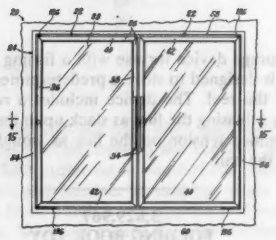


Drawing apparatus including a doll with pivotable joints, a desk which can capture the shoes of the doll so that the doll's arms lie over the upper desk surface, a drawing instrument designed to be held by a hand of the doll to feed a crayon therefrom so that the doll can draw on paper laid on the upper surface of the desk, and a wand for movement by a child, the wand having a magnet that can be moved around a region beneath the upper desk surface to pull the drawing instrument and crayon therein along a sheet of paper on the desk. A template defining a design to be drawn is placed on the desk beneath a sheet of paper, so that movement of the crayon results in the template design being drawn on the paper. The drawing instrument includes a spring or flat plate of rubber with a hole through which a crayon can be inserted so that the crayon is held tightly in place, and so that the crayon tends to be fed outwardly with a predetermined force.

3,629,972
REFRIGERATOR DOOR CONSTRUCTION

Thomas R. Rehberg, and Francis M. Niekrasz, both of Homewood, Ill., assignors to Ardco, Inc., Chicago, Ill.

Filed Feb. 9, 1970, Ser. No. 9,514
Int. Cl. E06b *7/12*
U.S. Cl. 49—70 **12 Claims**



One or more glass panel refrigerator doors are swingably mounted in a mounting frame. Each door is mounted so that it can be reversed between left- and right-hand swing. This is accomplished by providing upper and lower hinge pins rotatably mounted in the door, the pins having noncircular elements projecting from the door. A torsion spring is mounted in the door and is connected between one of the hinge pins and an adjusting member for regulating the initial stress in the spring. The noncircular elements of the hinge pins are engageable with socket members on the mounting frame. The socket members have noncircular openings and are movable between left- and right-hand positions on the mounting frame. Each door is reversed by removing the door, moving the socket elements to the opposite positions, inverting the door, and reinserting it into the frame. Each adjusting member is hidden when the door is closed, but is accessible when the door is open through a rearwardly facing recess formed in the door along the hinge axis. The recess is also employed to receive the connecting cord for the door heater. The cord is fitted with a plug which is positioned just behind the recess. To provide for reversal of the door, receptacles capable of accommodating left- or right-hand doors are mounted on the mounting frame to receive the plug in the left- and right-hand positions of the door.

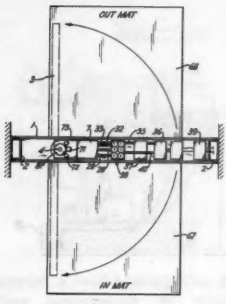
3,629,973
DOOR-OPERATING MECHANISM

Frank Bond, 1418 Wexford Ave., Parma, Ohio; Robert H. Boucherie, 266 Morewood Drive, Avon Lake, Ohio, and Everett K. Mentzer, 2010 Thalia Ave., Youngstown, Ohio

Filed Jan. 2, 1970, Ser. No. 294
Int. Cl. E05f *13/04, 15/04*
U.S. Cl. 49—264 **7 Claims**

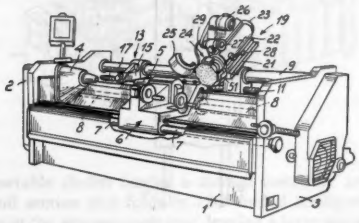
First and second fluid pressure operated means are provided for swinging a door open in opposite directions. There

are means actuated by a person approaching the door from either direction for supplying pressure fluid at a predetermined rate to the fluid pressure operated means that will



swing the door away from him. In case another person approaches the door from the direction toward which the door is opening, means are actuated by that person for reducing the opening speed of the door.

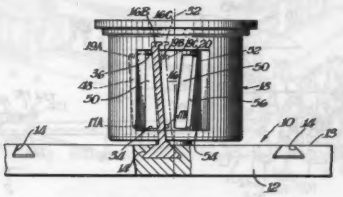
3,629,974
POLISHING AND DIAMOND-TRUING MACHINE FOR PHOTOENGRAVING
Giorgio Andreotti, Via Don Gnocchi, 29 Milan, Italy
Filed Jan. 21, 1970, Ser. No. 4,590
Claims priority, application Italy, June 20, 1969, 18477 A/69
Int. Cl. B24b *7/00*
U.S. Cl. 51—5 **6 Claims**



A polishing and diamond-truing machine for photoengraving cylinders wherein a frame on which a photoengraving cylinder is rotatably supported and operatively controlled in order to be machined by a diamond-truing tool unit mounted on an arm projecting transverse to said frame.

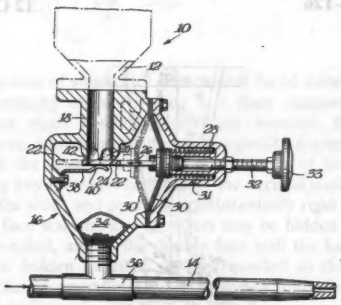
3,629,975
PARTICLE-THROWING APPARATUS
Harper W. Good, Waynesboro, Pa., assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed Oct. 10, 1969, Ser. No. 865,289
Int. Cl. B24c *3/00*
U.S. Cl. 51—9 **25 Claims**

A particle-throwing apparatus comprises a runnerhead having a plurality of radially mounted throwing vanes which are inclined with respect to the planar support surface of the runnerhead. An impeller case is mounted at the center of the runnerhead with a slotted impeller disposed in the impeller



case. Each impeller slot includes a particle projecting edge which is inclined parallel to a corresponding vane in the runnerhead.

3,629,976
ABRASIVE-TREATING APPARATUS
James H. Carpenter, Jr., Hagerstown, Md., assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed June 27, 1969, Ser. No. 837,271
Int. Cl. B24c *3/00*
U.S. Cl. 51—12 **9 Claims**

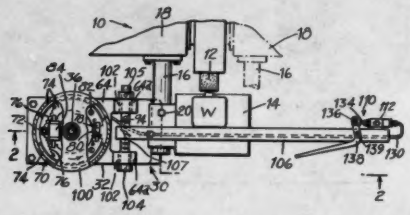


A treating apparatus includes particle feed means which supplied treating particles, such as abrasive shot, to a nozzle under pressure. Metering means is disposed between the feed means and nozzle and is actuated by the pressure to open and close communication therebetween. The metering means includes a particle outlet extending from the feed means and having a defined geometric shape with a metering gate being in sliding contact with the outlet. The metering gate also has an opening of a defined geometric shape so that the degree of registry of the openings controls the amount of particle flow to the nozzle.

3,629,977
WORK-FEEDING DEVICE
Robert L. Holden, Westboro, Mass., assignor to Norton Company, Worcester, Mass.
Filed Dec. 19, 1969, Ser. No. 886,578
Int. Cl. B24b *7/02*
U.S. Cl. 51—98 R **10 Claims**

A powered, adjustable, and pivotable elongated pressure bar for greatly assisting a snagging machine operator to feed

at various feed rates workpieces such as foundry castings into a multipoint cutting tool such as a grinding wheel or abrasive belt to rapidly remove fins, gates and risers therefrom. A high-torque and slowly rotating drive means is coupled by a variable fluid pressure actuated friction clutch mechanism to



a driven member which pivots the pressure bar held by the operator. A remote control is provided on the bar for the operator to actuate and control the friction clutch mechanism and thereby cause the pressure bar to exert the desired pressure against a workpiece placed between it and the cutting tool.

3,629,978

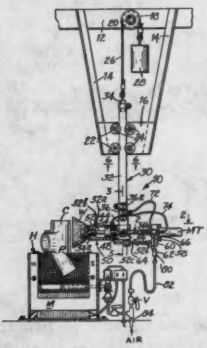
APPARATUS WITH SELECTIVELY RIGID AND FLEXIBLE SUPPORT CABLE

Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Filed Apr. 20, 1970, Ser. No. 30,004

Int. Cl. B24b *7/00*; **F16m** *1/00*

U.S. Cl. 51—126 **12 Claims**



An easily manually operated, positioned, and controlled apparatus having a fluid pressure system to drive and/or feed a tool into a workpiece. A toolhead is pivotally supported, for movement in various directions, at an end of an unsupported portion of a normally rigid movable composite cable extending longitudinally above a floor from between guide rollers mounted on a support. The composite cable is rigidified by a radially compressed bundle of flexible strands of wires held in frictional engagement by the contracting force of a resilient flexible tube expanded thereover. Hence, the composite cable acts like a solid shaft providing greater resistance to bending by the fluid pressure feed means. Fluid under pressure is admitted to inflate the resilient tube and separate the wires whereby the composite cable is easily flexed to position the toolhead adjacent the workpiece whereupon the fluid pressure is turned off to rigidify the flexed composite cable to retain the toolhead in the desired position and feed the tool therefrom.

3,629,979

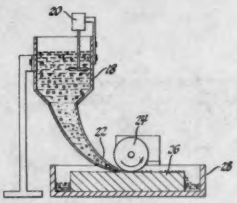
PROCESS OF ABRADING WITH GERMANIUM DIOXIDE

Walter A. Albers, Jr., Northville, and Don E. Swets, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1970, Ser. No. 28,772

Int. Cl. B24b *1/00*

U.S. Cl. 51—317 **3 Claims**



The abrasive qualities of tetragonal germanium dioxide are described, along with compositions and articles made with a tetragonal germanium dioxide abrasive. Techniques for using tetragonal germanium dioxide as an abrasive are also described.

3,629,980

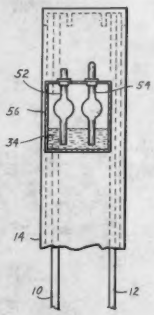
MULTIGLAZED WINDOW UNIT

Charles K. Hordis, Cinnaminson, N.J., assignor to Hordis Bros., Inc., Pennsauken, N.J.

Filed Jan. 5, 1970, Ser. No. 528

Int. Cl. F16k *9/00*

U.S. Cl. 52—1 **1 Claim**



A multiglazed window having a liquid-sealed venting system effective to normally provide a hermetic seal to the window interior but permitting airflow when the pressure differential between said interior and the surrounding atmosphere exceeds a predetermined value to thereby effectively limit such differential pressure.

3,629,981

ADJUSTABLE HEIGHT STRUCTURE COVER FOR MANHOLES AND THE LIKE

Joseph S. McCaffery, 1524 Wellington St., Oakland, Calif.

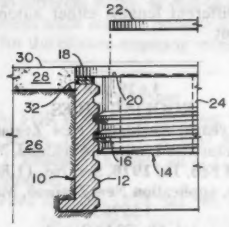
Continuation of application Ser. No. 671,012, Sept. 27, 1967, now abandoned. This application Oct. 6, 1969, Ser. No. 867,117

Int. Cl. E02d *29/14*

U.S. Cl. 52—19 **7 Claims**

An adjustable height assembly for supporting a cover over a subterranean access opening wherein a cylindrical frame

structure having interior coaxial acme threads is adapted to be permanently located in nonrotatable submerged position. An inner sleeve, having a conformingly shaped acme thread about the outer surface thereof, is provided to be received in threaded engagement with the cylindrical frame structure, the inner sleeve being adjustable in height by rotation and



designed to support a load-bearing disc-shaped cover flush with the surface surrounding the access opening. The threaded portions of the frame structure and inner sleeve are effectively sealed from the surrounding earth and pavement so that height adjustment may be relatively easily accomplished even after a prolonged period of installation and use.

3,629,982

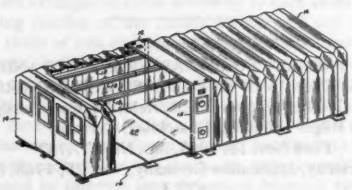
PORTABLE FOLDABLE SHELTER

Joseph M. Ballay; William R. Wakefield, both of Cincinnati, Ohio; Lawrence L. Fabbro, River Vale, N.J., and James M. Alexander, Jr., Cincinnati, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed July 15, 1970, Ser. No. 54,952

Int. Cl. E04b *1/344, 1/347, 7/04*

U.S. Cl. 52—69 **3 Claims**



A portable shelter having a storage container and a roof and wall section that folds in 180° folded configuration for storage in the storage container, leaving a large storage space in the lower portion of the container. Foldable roof support beams are stored below the roof and wall section in the container. End walls are hinged to floor sections which fold out from opposite sides of the storage container. Flysheets are secured to the roof and wall sections and have locking seals which attach to flanges on the central container endwalls and floor to provide seals. Leveling jacks are attached to the floor sections to level the floor of the shelter.

3,629,983

PRECONSTRUCTED MULTIPLE UNIT HOUSING

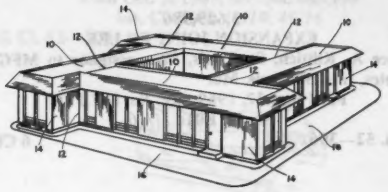
Louis J. Jenn, 4917 Laurel Circle, Indianapolis, Ind.

Continuation-in-part of application Ser. No. 744,721, July 15, 1968, now abandoned. This application Sept. 2, 1969, Ser. No. 854,671

Int. Cl. E04b *1/02*; **E04b** *1/348*

U.S. Cl. 52—169 **18 Claims**

This disclosure is to a new and useful physical arrangement of substantial preconstructed building modules or living units which can be manufactured in a plant and then transported to location and there assembled together in a manner to



achieve styling, efficiency of construction and economy of land use.

3,629,984

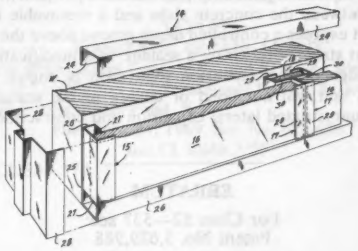
MODULAR PANEL WALL SYSTEM

Cletus Richardson, 3419 A Winnebagi St., St. Louis, Mo.

Filed May 19, 1970, Ser. No. 38,749

Int. Cl. E04h *1/00*

U.S. Cl. 52—241 **7 Claims**



A system of single face and double faced panel walls having vertically aligned ceiling and floor channel members, grooved studs extending vertically between the channel members, wall forming panels marginally engaged for support in the channel members and grooves of the studs and locking key members engaged in the vertical stud grooves to unite the studs and panels in a substantially rigid wall. In the single face wall the key members may be hidden or more or less revealed, and in the double face wall the key members may be hidden or more or less revealed so that in either character of assembly the key members may when revealed form a wall panel.

3,629,985

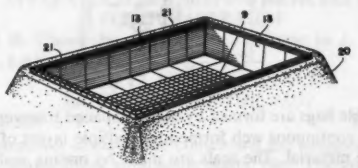
PREFABRICATED WATER TANK

Chozaburo Ueno, Chiba-shi, Japan, assignor to Kawasaki Steel Corporation, Kobe-shi, Japan

Continuation-in-part of application Ser. No. 697,773, Jan. 15, 1968, now Patent No. 3,500,602. This application Jan. 19, 1970, Ser. No. 3,796

Int. Cl. E02d *27/46*; **E04h** *7/02*

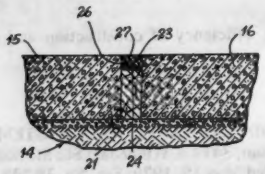
U.S. Cl. 52—265 **2 Claims**



A lightweight water tank construction having sidewalls and a grid base, the grid base being formed of a plurality of connecting plates, channel members and capping members designed so as to allow the bottom structure to relatively shift

to absorb forces created by ground swelling or water pressure.

3,629,986
EXPANSION JOINT FILLER
Clarence A. Klittich, St. Louis, Mo., assignor to MFG Associates, Inc., St. Louis, Mo.
Filed Dec. 22, 1969, Ser. No. 887,173
Int. Cl. E01c *11/10*
U.S. Cl. 52—396 **6 Claims**

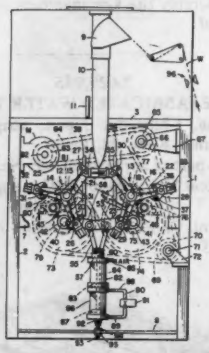


An expansion joint assembly used between concrete slabs. A lower expansion joint strip that becomes permanently positioned between the concrete slabs and a removable topping strip that exposes a controlled depth groove above the expansion joint strip for receiving a sealant. In a modification, the upper edge of the expansion joint strip is coated with a material that will not bond or adhere to the sealant, permitting unrestricted lateral expansion and contraction of the sealant.

ERRATUM

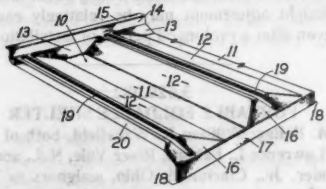
For Class 52—537 see:
Patent No. 3,629,988

3,629,987
BAG FORMING, FILLING AND SEALING MACHINE
King L. Klopfenstein, Prospect Heights, and Erik O. Vilen, Niles, both of Ill., assignors to Triangle Package Machinery Company, Chicago, Ill.
Filed May 27, 1970, Ser. No. 40,753
Int. Cl. B65b *9/12*
U.S. Cl. 53—182 **15 Claims**



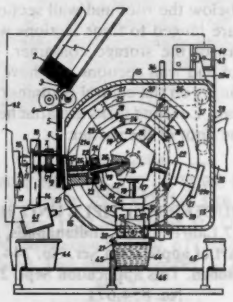
Flexible bags are formed by making spaced transverse seals along a continuous web formed by multiple layers of a heat-sealable material. The seals are made by mating sealing and cutting elements extending radially from a pair of rotary members or wheels rotating in opposite directions, to which heat is supplied by suitable means, said elements clamping the web therebetween, thus sealing and cutting and advancing the web as the members rotate. In a vertical machine the transverse seals form the bottom of one bag and the closed top of the preceding bag after it has been filled with the desired commodity. The rotary members are mounted on shafts which are displaceable toward and away from each other, thereby enabling the sealing members to move in a straight line together during the sealing operation. Means are provided for controlling the timing of the meeting and separating of the sealing elements, thereby enabling the making of bags of different lengths either automatically or by manual adjustment.

3,629,988
ROOFING TILES
Jan Hendricus Zylstra, Auckland, New Zealand, assignor to Alex Harvey Industries Limited, Auckland, New Zealand
Filed Feb. 16, 1970, Ser. No. 11,801
Claims priority, application New Zealand, Mar. 31, 1969, 155963
Int. Cl. E04d *3/362*
U.S. Cl. 52—537 **6 Claims**



A roofing panel having a pattern of well-defined fluting extending across it with an upturned one edge and a downturned opposite edge extending across ends of the flutings characterized in that at least at one end of the pattern has bevelled or sloping areas.

3,629,989
APPARATUS FOR WRAPPER INSERTS AND COVERINGS OF CUP-SHAPED CONTAINERS
Gunter Reinecke, Wuppertal-Elberfeld, Germany, assignor to Benz & Hilges G.m.b.H., Dusseldorf, Germany
Filed Nov. 18, 1969, Ser. No. 877,737
Claims priority, application Germany, Nov. 29, 1968, P 18 11 677.3
Int. Cl. B65b *57/02, 7/28*
U.S. Cl. 53—64 **5 Claims**



An apparatus for insertion of cover sheets and for covering up of cup-shaped containers, which comprises a pile of sheets

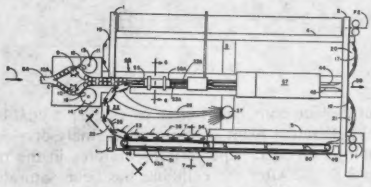
and of covers, respectively, and a removal device. A conveyor device is provided for setting individual workpieces into and on the containers, respectively. The conveyor device comprises at least two movement-controlled closure-applying units continuously revolving within a guide path closed on itself. The closure-applying units include closure-engaging members and the latter receive workpieces. Means are provided for controlling the closure-engaging members in such manner, that in feeding planes of the workpieces, extending tangentially to different paths, as well as of the containers, a joint engagement track making possible a workpiece change, is contained for the closure-engaging members.

3,629,990

MECHANISM FOR FORMING SHRINK FILM PACKAGES

Rodney K. Calvert, Dunwoody; Arthur B. Viescas, Decatur, and Alton J. Fishback, Austell, all of Ga., assignors to The Mead Corporation

Filed Apr. 24, 1970, Ser. No. 31,688
Int. Cl. B65b 9/04, 47/10
U.S. Cl. 53—184 3 Claims



Two series of endless chains each comprising a plurality of traylike open half shells pivotally interconnected at their ends are arranged in close proximity to each other so that the working reaches of the chains are parallel and so that the open shells of one chain are disposed in opposed relation to the open shells of the other chain to form a series of cavities along the working reaches of the chains. A strip of heat-sealable shrink film is disposed along and held against the open faces of the half-shells of each of the chains and vacuum means is employed to draw the film into lining relation with each of the half-shells. An assembly of items to be packaged in inserted into the space between two opposed half-shells adjacent the entry end of the working reaches of both chains. After the half-shells of one reach come into biased engagement with the open half-shells of the other reach to envelope an assembly of items to be packaged, a jet of heated air is applied along the top and bottom edges of the shells to form top and bottom seals between the strips thereby to form a series of interconnected packages. After the packages are formed by heat sealing, the mating shells are moved in opposite directions away from each other and heated air is subsequently applied to each package so as to shrink the film somewhat thereby to preserve the integrity of the package. Preferably the film is of the nonoriented-type and is preheated before being drawn into the half-shells.

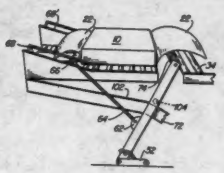
After a plurality of packages are formed in interconnected following relationship by the mechanism and method of this invention, the packages are severed one from another by any suitable means. One arrangement for severing interconnected packages is disclosed and claimed in U.S. Pat. application Ser. No. 17,459 filed Mar. 9, 1970. While the package itself may take several specific forms, a typical package is disclosed and claimed in U.S. Pat. application Ser. No. 49,270 filed Nov. 3, 1970 wherein a package having open ends is disclosed.

3,629,991

BUNDLE-WRAPPING APPARATUS

George H. Sundin, Duluth, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Oct. 2, 1969, Ser. No. 863,299
Int. Cl. B65b 11/10, 49/16
U.S. Cl. 53—209 7 Claims



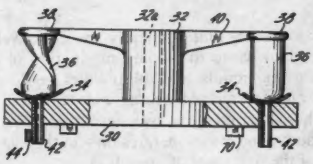
A bundle-wrapping device is disclosed for wrapping paper about a bundle moving along a conveyor in the direction of movement of the bundle. The wrapping roller for wrapping the paper about the bundle is activated directly by the bundle moving along the conveyor.

3,629,992

CONVEYOR ARRANGEMENT

Howard Price, Kings Point, N.Y., and Seymour Wallick, Clifton, N.J., assignors to International Patents & Development Corporation, Kings Point, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,656
Int. Cl. E04b 2/00
U.S. Cl. 53—370 11 Claims



A conveyor arrangement in which a rotatable circular platform is indexed with respect to the discharge locations of refuse compactors. A Y-shaped structure beneath the circular platform carries a plurality of wheels which support the platform while, at the same time, permitting rotational motion thereof with substantially small frictional resistance. A motor and geared speed-reduction unit supported by the Y-shaped structural frame is mechanically coupled to the platform. A closure arrangement, extending angularly along a portion of the angular path of the platform, rotates the base of a flexible container bag for the purpose of closing the bag at its neck after having been filled with compacted refuse.

3,629,993

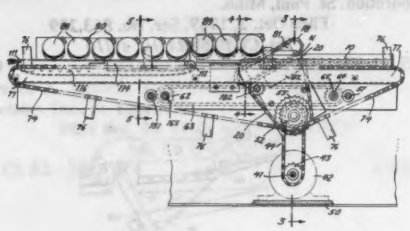
APPARATUS FOR WRAPPING ARTICLES IN STRETCHABLE FILM

Albert H. Chant, Jr., Holland, Pa., assignor to J. B. Dove, Inc., Levittown, Pa.

Filed May 12, 1969, Ser. No. 823,736
Int. Cl. B65b 7/08, 51/10, 51/32
U.S. Cl. 53—379 10 Claims

Apparatus is disclosed for completing the wrapping of articles in heat-sealable stretchable plastic film. The articles are presented to the apparatus encircled in a tube of film, with portions of the tube projecting beyond each side of the article. These projecting portions are gripped at each side by

gripper chains and pulled diagonally downward in a substantially vertical plane to stretch the film tightly about the article. The stretched film is then folded on to the underside of the article and heat sealed.

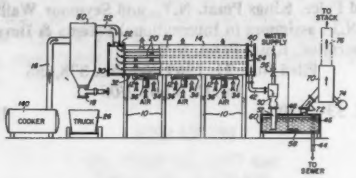


3,629,994

CONDENSING UNIT AND METHOD OF USE

Royal R. Jones, Birmingham, Ala., assignor to The Cincinnati Butchers' Supply Company, Cincinnati, Ohio

Filed Mar. 30, 1970, Ser. No. 23,710
Int. Cl. B01d *50/00*
U.S. Cl. 55—20 **15 Claims**



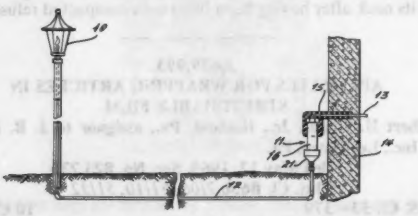
The condensing unit efficiently and effectively treats meat packing plant waste to obviate production of objectionably odorous gases, liquids, and solids which could otherwise pollute surrounding air and nearby watercourses; the treatment being characterized by a two-step condensing operation in which the second stage operates only in the event of overburdening of the first stage of operation.

3,629,995

A METHOD FOR REDUCING MOISTURE CONTENT IN GAS

John Moten, Jr., University City, Mo., and Walter A. Kluthe, East St. Louis, Ill., assignors to Laclede Gas Company, St. Louis, Mo.

Filed Dec. 29, 1969, Ser. No. 888,403
Int. Cl. B01d *53/04*
U.S. Cl. 55—33 **6 Claims**



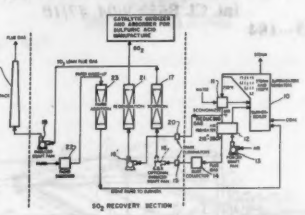
A method for removing a portion of the moisture from gas streams by passing the gas stream over an efflorescent salt. The invention is particularly useful for natural gaslines from heated basements to outside appliances, such as gaslights, barbecue pits and gasmeters. The efflorescent salt removes sufficient water from the gas in cold weather to keep the line from freezing or moisture condensing in it and the salt regenerates itself in warm outside temperatures by releasing its retained moisture to the gas stream which then can handle more moisture without freezing.

3,629,996

CELLULOSICS FOR THE REMOVAL OF SULFUR DIOXIDE FROM FLUE GAS STREAMS

Robert A. Meyers, Encino; John S. Land, Hermosa Beach; Christopher C. Shih, Inglewood, and Jerry L. Lewis, Cypress, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 19, 1970, Ser. No. 12,770
Int. Cl. B01d *53/04, 47/00;* **A23k** *1/00*
U.S. Cl. 55—73 **7 Claims**



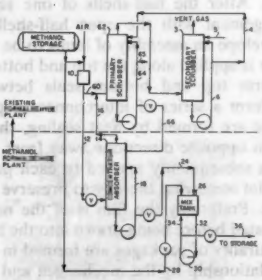
Sulfur dioxide contained in flue gases from a coal-burning, thermal generating plant are sorbed on finely divided cellulose such a shredded paper at temperatures in the range of 215° to 300° F. After the cellulose has been saturated with the sulfur dioxide, it is desorbed by flue gas at about 350°–450°F. The desorbed sulfur dioxide may be then conveniently forwarded to a plant for processing to sulfuric acid. Spent cellulose may be forwarded to the plant for burning or it may be further digested to carbohydrates.

3,629,997

PROCESS FOR PRODUCING METHANOL-FORMALDEHYDE SOLUTION OF LOW-WATER CONTENT

Charles William DeMuth, Unadilla, N.Y., assignor to Borden Inc., New York, N.Y.

Filed May 8, 1970, Ser. No. 35,847
Int. Cl. B01d *47/00*
U.S. Cl. 55—89 **14 Claims**



A gaseous stream from a formaldehyde converter is introduced into a concentrator-absorber wherein the gaseous stream is scrubbed countercurrently with an aqueous formaldehyde solution from a water absorber of a conventional formaldehyde plant. The bottom stream withdrawn from the concentrator-absorber is recirculated to the top of the concentrator-abosrber and a portion of this stream is withdrawn

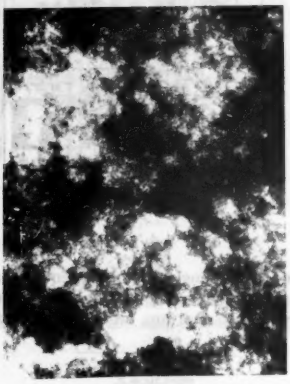
and mixed with methanol to provide a methanol-formaldehyde solution of the desired concentration.

3,629,998

POWDER POLYETHYLENE ADSORBENT

Masaaki Takehisa, Takasai-shi, Japan, assignor to Japan Atomic Research Institute

Filed Feb. 23, 1968, Ser. No. 707,856
Claims priority, application Japan, Mar. 2, 1967, 42/12834
Int. Cl. B01d *53/04*
U.S. Cl. 55—71 **14 Claims**



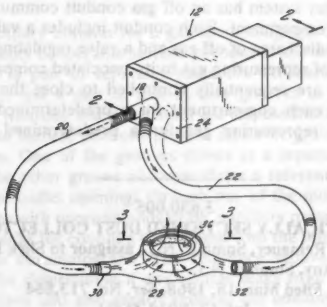
Powder polyethylene produced by polymerizing ethylene in a gaseous phase or in a liquid phase or a gas-liquid mixed system, where the liquid comprises a solvent or solvents in which the polyethylene does not dissolve, by means of an ionizing radiation or a radical initiator at a temperature lower than the melting point of the polyethylene to be produced has unique surface properties and adsorbs vapors of various organic compounds and volatile fission products. Further, powder polyethylene which has undergone a modification treatment such as cross-linking, graft polymerization or coating of particles with other polymer materials serves similarly as an adsorbent.

3,629,999

CLEAN AIR TARGET DEVICE

Robert Claude Marsh, Albuquerque, N. Mex., and James Edward Woods, Manhatten, Kans., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Aug. 20, 1969, Ser. No. 851,604
Int. Cl. B01d *46/00*
U.S. Cl. 55—97 **5 Claims**



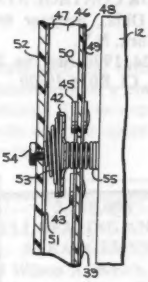
A unit for providing particulate control of a target area comprises means for generating an airflow, means for effectuating a substantially contaminant-free conditioning of said airflow located in the path of said airflow, an annular diffuser having a radially projecting lip on the superior edge of the inner periphery of said diffuser, and an air plenum capable of uniformly directing said conditioned airflow against the outer surface of said diffuser. A method for providing particulate control of a target area comprises generating a decontaminated airflow and directing said airflow uniformly about the outer surface of an annular diffuser, said diffuser having a radially projecting lip on the superior edge of the inner periphery of said diffuser, whereby an object placed within the well of said diffuser is protected from internal and external contamination by a vertically flowing air barrier.

3,630,000

ELECTROSTATIC AIR CLEANER

Donald M. Mullings, Yardley, Pa., assignor to General Electric Company

Filed Nov. 28, 1969, Ser. No. 880,749
Int. Cl. B03c *3/02*
U.S. Cl. 55—139 **1 Claim**



An electrostatic air cleaner having a deenergizing or grounding device operative upon opening of a closure member to ground electrical components within the cleaner cabinet. The device includes at least two spaced contacts and a bridging element. One of the contacts is connected to ground and the other to a component within the cabinet. A spring biases the bridging element toward engagement with both contacts. An operator connected to the bridging element forces the bridging element out of engagement with the contacts when the closure member engages the operator upon closing of the closure member. The operator is resilient to compensate for variances but is less resilient than the spring so as to overcome the spring.

3,630,001

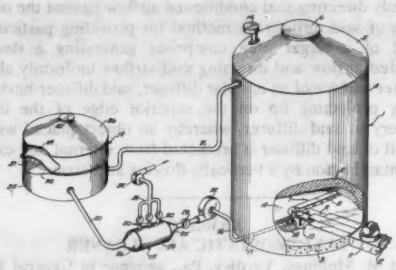
ATMOSPHERIC CONTROL APPARATUS FOR A SEALED STORAGE STRUCTURE

Frank D. Hamerski, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Apr. 21, 1969, Ser. No. 817,874
Int. Cl. B01d *53/22*; **A01f** *7/04*
U.S. Cl. 55—158 **4 Claims**

A sealed storage system such as a silo having a breathing system including a flexible pressure-responsive member having one surface exposed to the pressure within the silo and the opposite surface exposed to atmospheric pressure. An atmosphere control apparatus is provided and includes a gas separator through which gas from the structure is circulated. The separator includes a series of membranes which selectively separate oxygen from the gas so that substantially ox-

ygen-free gas is returned to the storage structure. The atmosphere control apparatus supplies the oxygen-free gas



through a reservoir that also contains the silo breathing system.

3,630,002

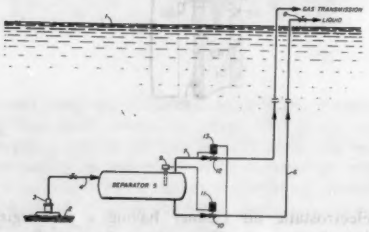
SEPARATOR CONTROL SYSTEM

Bill S. Burrus, Tulsa, Okla., assignor to Combustion Engineering, Inc., New York, N.Y.

Filed Mar. 24, 1970, Ser. No. 22,224

Int. Cl. B01d *19/00*

U.S. Cl. 55—164 **5 Claims**



A separator receiving the output of a subsea well is connected to gas and liquid transmission conduits for delivery of the fluids for subsequent use or processing. The transmission conduits are controlled by valves responsive to pressures of the system and the force of springs.

3,630,003

COOLING ARRANGEMENT FOR COMBINE ENGINE

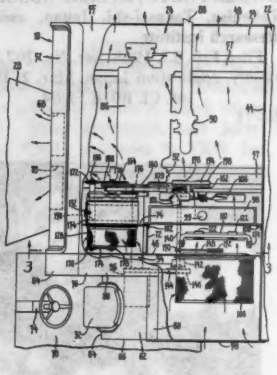
Robert Ashton, Islington, Ontario, and Wilbert D. Weber, Nashville, Ontario, both of Canada, assignors to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada

Filed Oct. 30, 1969, Ser. No. 872,629

Int. Cl. B01d *46/26*

U.S. Cl. 55—268 **6 Claims**

A self-propelled harvester thresher having a grain tank, an engine compartment mounted on top the separator in front of the grain tank, an operator's platform mounted adjacent to one side of the engine compartment, an engine mounted in the engine compartment, a first driven rotary screen mounted on the side of the engine compartment adjacent to the operator's platform, a radiator mounted inside the engine compartment, and a first fan mounted adjacent to the radiator for pulling air through the screen and the radiator and forcing the air to move across the rear portion of the engine compartment and out through a grill in the side of the engine compartment away from the operator's platform. A second fan is mounted on the wall of the engine compartment adjacent to the operator's platform for pulling air through a driven rotary screen and forcing the air to move through the



forward portion of the engine compartment. Oil coolers for the hydraulic systems and condensers for air conditioners can be placed adjacent to the fans inside the engine compartment.

3,630,004

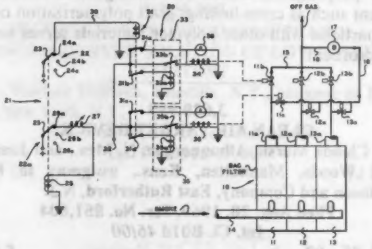
CONTROL SYSTEM FOR BAG FILTERS

James G. Adair, Elgin, Ill., and Harold L. Boots, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Mar. 3, 1969, Ser. No. 803,848

Int. Cl. B01d *46/04*

U.S. Cl. 55—273 **4 Claims**



A bag filter system has an off gas conduit communicating with each compartment. Each conduit includes a valve controlling the discharge of off gas and a valve regulating the introduction of repressuring gas to its associated compartment. The valves are sequentially controlled to close the off gas conduit of each compartment for a predetermined period and admit repressuring gas for a predetermined shorter period.

3,630,005

VERTICALLY SECTIONED DUST COLLECTOR

Thomas V. Reinauer, Summit, N.J., assignor to Slick Industrial Company, Summit, N.J.

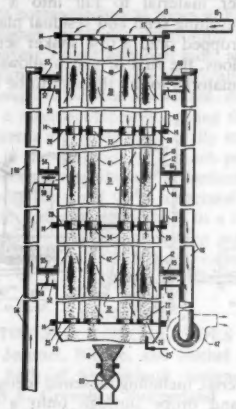
Filed Mar. 18, 1968, Ser. No. 713,864

Int. Cl. B01d *46/04*

U.S. Cl. 55—302 **17 Claims**

Apparatus for separating particulate matter from gaseous carriers formed of a plurality of discrete filter chambers

disposed in vertical superposed relation interconnected by a vertically oriented conduit member that is constituted, at



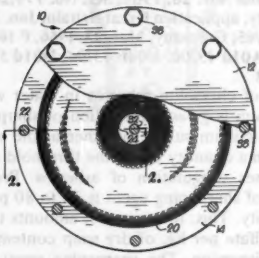
least in part, by permeable filter medium that forms a portion of the defining walls of each such chamber.

3,630,006

SPIRAL CAPILLARY GAS CHROMATOGRAPHIC COLUMN

Antonio A. Sandoval, 3744 Benton Blvd., Kansas City, Mo.

Filed Nov. 5, 1969, Ser. No. 874,122
Int. Cl. B01d *15/08*
U.S. Cl. 55—386 5 Claims



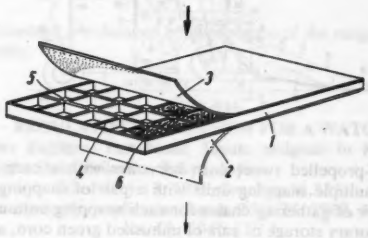
A capillary column for a gas chromatograph is presented by mutually cooperable surface portions of the complemental faces of a pair of separable members. At least one of the members has a pair of side-by-side grooves in the surface thereof whereby when the faces are disposed in interengagement the surface portions present a pair of groove capillary passages. One of the grooves serves as a separation groove while the other groove accommodates a reference standard. Inlet and outlet openings through one of the members communicate with opposite ends of the capillary passage and provides means for coupling the column with the inlet and outlet of a gas chromatograph. The reference groove provides a check for determining if any sample leaks from the separation groove and also greatly reduces the amount of leakage by equalizing the pressure on the separation groove. The members are easily disengaged to permit recoating of the partitioning material onto the grooved surface and can be quickly reassembled to present a fresh column.

3,630,007

PLATE-SHAPED DISPOSABLE ACTIVE CHARCOAL FILTER

Gerhard Max Neumann, Berlin, Germany, assignor to Delbag-Luftfilter Gesellschaft mit beschrankter Haftung, Berlin, Germany

Filed Mar. 26, 1969, Ser. No. 810,716
Claims priority, application Germany, June 12, 1968, P 17 57 764.9
Int. Cl. B01d *39/00*
U.S. Cl. 55—387 4 Claims



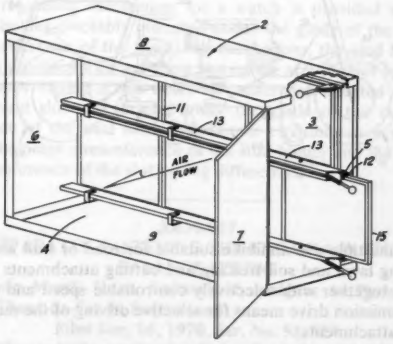
A disposable active charcoal filter has a frame open at both sides and subdivided into a plurality of compartments by intersecting partitions. The two open sides are covered by gas-permeable sheets and the space between the sheets is filled with active carbon.

3,630,008

FILTER CELL SEALING AND RETAINING ARRANGEMENT

Alan E. Revell, and Wilson A. Welch, both of Louisville, Ky., assignors to American Air Filter Company, Inc., Jefferson County, Ky.

Filed Oct. 23, 1969, Ser. No. 868,872
Int. Cl. B01d *25/22*
U.S. Cl. 55—493 2 Claims

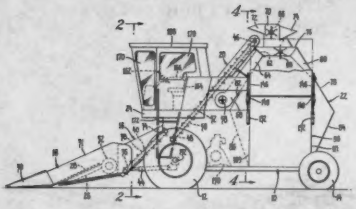


A sealing and retaining arrangement for a flow-through filter cell housing including a retaining bar slidably mounted on said housing for actuatable movement in both a longitudinal and lateral direction, the filter cell housing having a longitudinally track mounted slidable hollow peripheral seal formed from several sections, at least one of which is compressible and oversize in length to bear firmly against the other.

3,630,009
SELF-PROPELLED SWEET CORN HARVESTER

Robert Ashton, Islington, Ontario, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada

Filed Oct. 30, 1969, Ser. No. 872,561
Int. Cl. A01d *45/02*
U.S. Cl. 56—11.9 10 Claims

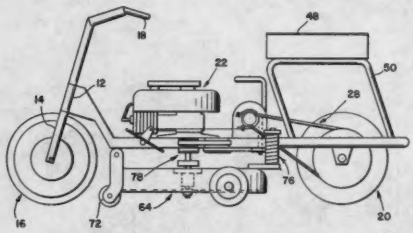


A self-propelled sweet corn harvester with a corn head having multiple snapping units with a pair of snapping rolls and a pair of gathering chains for each snapping unit, a tank for temporary storage of ears of unhusked green corn, a conveyor system to elevate the ears of corn from the corn head to the storage tank, and cleaning means including a fan, an upper beater, a lower beater and hoods for removing stalks and other trash from the ears of corn. The beaters are mounted above the storage tank for both vertical and horizontal adjustment. A conveyor system is provided for removing the cleaned and husked ears of green corn from the tank.

3,630,010
MULTIUSE MINIBIKE

James E. Rester, 105 Auburn Drive, Clinton, Miss.

Filed July 10, 1970, Ser. No. 53,851
Int. Cl. A01d *35/26*
U.S. Cl. 56—13.5 5 Claims



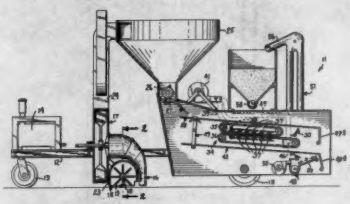
A multiple use minibike suitable for road or trail use, and having lawn and soil treating and cutting attachments therefore, together with selectively controllable speed and power transmission drive means for selective driving of the minibike and attachments.

3,630,011
DICHONDRA HARVESTER

Frank W. Dunn, Woodland, Calif., assignor to Northrup, King & Co., Minneapolis, Minn.

Filed July 13, 1970, Ser. No. 54,386
Int. Cl. A01d *41/08, 45/30*
U.S. Cl. 56—126 20 Claims

The disclosure is directed to a seed harvester for dichondra. The harvester is a wheeled vehicle drawn by a tractor or the like which passes over the dichondra crop and picks up seed bearing plant material by means of a rubber paddled beater. The plant material is carried upwardly to a cyclone separator, which removes and discharges dust and dirt while allowing heavier material to fall into a seed removing cylinder. The resulting seed and residual plant material and dirt are then dropped onto a first shaker screen having two grid configurations, the first of which allows ground up dirt and other fine material to fall through to be discharged. The



remaining material, including loosened seeds, moves onto the second grid and drops through onto a differential belt thresher which removes the remaining seed and grinds up residual material into fine particles. This residue is disposed of through the finer grid portion of a second multigrid screen, the seed passing onto a second grid and being exposed to a cleaning fan upon dropping therethrough. The seed undergoes a final screening before discharge into collection boxes.

3,630,012
ASBESTOS FABRICATING PROCESS AND PRODUCTS THEREOF

Horst C. G. H. Guertler, Cheadle Hulme, England, assignor to Rex Asbestwerke Graf von Rex KG Schwabisch Hall, Germany

Continuation-in-part of application Ser. No. 522,029, Jan. 21, 1966, now abandoned, Continuation-in-part of application Ser. No. 625,307, Mar. 23, 1967, now abandoned. This application Nov. 26, 1968, Ser. No. 779,264
Claims priority, application Great Britain, Jan. 25, 1965, 3170/65; 3171/65; Germany, Mar. 23, 1966, P 16 69 524.2
Int. Cl. A01d *43/00*; C04b *43/04*; D01d *5/14*
U.S. Cl. 57—153 13 Claims

A dispersion of chrysolite asbestos in water with soap as dispersion medium is given an addition of sharpening agent consisting of aluminum sulfate or other acidic soap-precipitant substance in a quantity below the threshold at which the precipitant causes coagulation of asbestos. Preferably the added quantity of sharpening agent is 20 to 80 percent of its threshold quantity. This, for example, amounts to 50–200 g. of aluminum sulfate per kg. of dry soap content in a 2 percent asbestos dispersion. The sharpening agent is added in such a manner as to prevent local or partial coagulation. This is done by first dissolving the sharpening agent in the water subsequently used for preparing the asbestos dispersion, or by dissolving the sharpening agent in water and stirring the solution into the previously prepared aqueous dispersion. The addition improves storability and extrudability of the dispersion as well as the tensile strength of the asbestos strand or yarn made therefrom.

3,630,013
TEXTURED YARN AND PROCESS FOR ITS MANUFACTURE

Michel Buzano, Villeurbanne, France, assignor to Societe Rhodiaceta, Paris, France

Filed June 2, 1969, Ser. No. 829,752
Claims priority, application France, June 6, 1968, 50070
Int. Cl. D02g *3/34, 1/02*; D02j *1/06*
U.S. Cl. 57—140 R 18 Claims

The invention comprises textured continuous filament yarns of a synthetic thermoplastic material, especially a

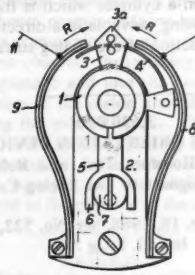
polyester such as polyethylene terephthalate in which each filament comprises, on the microscopic scale, alternating zones whose diameter increases and decreases progressively between at least two different mean values, the zones of smaller diameter corresponding to zones of higher crystallinity index and higher molecular orientation and vice versa, each filament having a large apparent bulk, and the yarn as a whole having tridimensional crimp. Preferably the filaments have similar, though somewhat attenuated, differences along their length on a macroscopic scale, giving them a knop appearance. The yarns are made by partially stretching a multifilament yarn in the presence of a crack-producing agent, such as an aqueous lower alkanol at ambient temperature, giving the partially stretched yarns a thermal treatment in a relaxed condition, and subjecting them to a twist-set-untwist treatment, in which the heat setting step may also provide part of or the whole of the said thermal treatment.

3,630,014

TIMEPIECE OSCILLATORS

Pierre Maurice Jeannet, Bienne, and Michel Camille Girardin, Bellach, both of Switzerland, assignors to Certina Kurth Freres S.A., Grenchen, Switzerland

Filed Jan. 19, 1970, Ser. No. 3,901
Claims priority, application Switzerland, Jan. 24, 1969, 1056/69
Int. Cl. G04c *3/00*; H02k *33/02*; H03b *3/04*
U.S. Cl. 58—23 **7 Claims**



Disclosed herein is a timepiece oscillator disposed in a fluidtight enclosure at a pressure below 1 mm. of mercury, preferably of the order of 10^{-3}mm. The frequency of oscillation can be adjusted by bimetal strips operated by control means outside the enclosure. Means for maintaining and adjusting vibration of the oscillator can be included in the enclosure which forms a unit pluggable into a timepiece. For a mechanical watch, the fluidtight enclosure advantageously contains the entire movement.

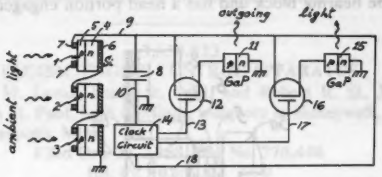
3,630,015

LIGHT TRANSFORMATION DEVICE

Kurt Lehovec, 11 Woodlawn Drive, Williamstown, Mass.

Continuation-in-part of application Ser. No. 824,624, May 14, 1969, now abandoned. This application Jan. 20, 1970, Ser. No. 4,358
Int. Cl. G04b *19/30*
U.S. Cl. 58—50 **18 Claims**

Incident light is transformed into electricity, which generates, or else modulates, outgoing light providing an optical contrast, and resulting in a self-powered display unit.



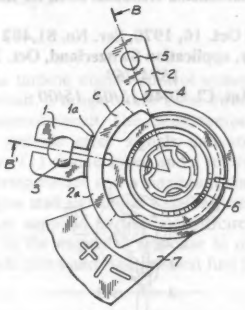
The contrast is enhanced by modulation of the outgoing light intensity.

3,630,016

REGULATING MECHANISM FOR A WATCH

Hajime Fujihira, Funabashi, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed May 11, 1970, Ser. No. 36,331
Claims priority, application Japan, May 24, 1969, 44/47637
Int. Cl. G04b *17/14*
U.S. Cl. 58—109 **1 Claim**



A regulating mechanism for a watch is provided with a stud holder pivotably mounted under the guide of the outer circumference of the regulating mechanism, the stud holder being provided with a shallow slot on the arm thereof and the regulator having a thin outer circumference inserted in the aforesaid slot and turning under the guide of the circumference of the stud holder, the outer circumference of the slot the outer circumference of the stud holder and the inner circumference of the slot having different radii.

3,630,017

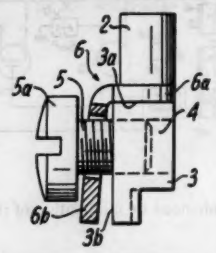
APPARATUS FASTENING THE END OF A WATCH BALANCE SPRING

Frederic Marti, Nyon, Switzerland, assignor to Portescap, LaChaux-de-Fonds, Switzerland

Filed Dec. 16, 1970, Ser. No. 98,729
Claims priority, application Switzerland, Dec. 17, 1969, 18999/69
Int. Cl. G04b *17/14*
U.S. Cl. 58—113 **9 Claims**

In a watch having a balance spring and a balance cock, apparatus is provided for fastening the free end of the spring to the cock. The fastening apparatus includes a bearing block, pivotally mounted on the cock, having a generally vertically extending bearing surface for engagement with the spring. A resilient clamping member is mounted on the cock and includes a clamping arm positioned in spaced relation to the

bearing surface to define a space therebetween which receives the free end of the balance spring. A fastening screw extends through the clamping arm in threaded engagement with the bearing block and has a head portion engaged with



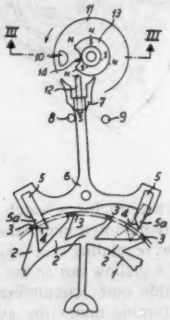
the clamping arm on the side thereof opposite the spring for urging the clamping arm towards the bearing surface when the screw is tightly threaded in the block to thereby clamp the spring between the clamping arm and the bearing surface.

3,630,018

TIMEPIECE ESCAPEMENT

Aerschmann Nicholas, Geneva, Switzerland, assignor to Les Fabriques d'Assortiments Renunies S.A., Le Locle, Switzerland

Filed Oct. 16, 1970, Ser. No. 81,402
Claims priority, application Switzerland, Oct. 22, 1969, 15745/69
Int. Cl. G04b *15/08, 15/00*
U.S. Cl. 58—122 1 Claim



A lever escapement for timepieces includes a guard pin at one end of a pivotable lever, which guard pin at least in part is constituted by a magnet having a predetermined polarity at its free end. The safety roller cooperating with said guard pin is also constituted in part by a magnet the external part of the magnet facing the free end of the guard pin having the same polarity as the latter. The repulsion between the guard pin and the safety roller ensures the maintenance of the lever against a banking pin arranged to one side of the lever.

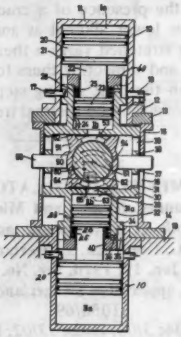
3,630,019

HEAT-OPERATED PRIME MOVER WITH HYDROSTATIC POWER TRANSMISSION

Herwig Kress, Klocken 5, 7981 Oberzell, Germany

Filed Feb. 5, 1970, Ser. No. 8,883
Claims priority, application Germany, Feb. 6, 1969, P 19 05 787.5
Int. Cl. F02b *41/00;* F03g *7/06*
U.S. Cl. 60—19 26 Claims

A thermal engine with hydrostatic power transfer having reciprocable piston means including working piston means and hydrostatic piston means, in which an eccentrically journaled cylindrical journal is surrounded by an annular body which by at least one sealing surface seals at least one hydrostatic working chamber which is located on that side of the surface of the journal which faces toward said piston means, and in which said annular body has at least two oppositely located guiding extension provided with sealing surfaces which guiding extensions sealingly slide on two sliding surfaces of a slide member while said sliding surfaces are interconnected by at least two arms. The sliding member has at least two extensions preferably forming hydraulic cylinders and having a circular cross section, said extensions being displaceably mounted in a cylinder which is fixedly connected to the housing and being movable in a direction perpendicular to the sliding direction of the sliding surfaces or the sealing surfaces.

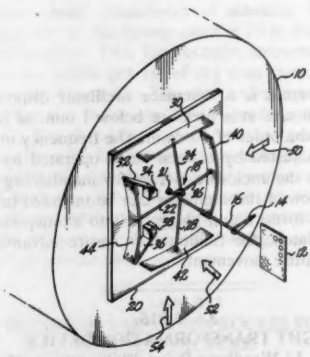


3,630,020

SOLAR ORIENTATION DEVICE

Thomas H. Chase, Houston, Tex., and Robert M. Weigel, Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 18, 1968, Ser. No. 722,291
Int. Cl. F03g *7/06*
U.S. Cl. 60—23 4 Claims



A servomechanism apparatus which will continuously track a moving heat source through its plane of travel. A plurality of bimetallic elements are connected to a crank on an orientation shaft in a manner such that as the elements individually deform under radiant heating, they will actuate the crank and rotate the orientation shaft in a direction cor-

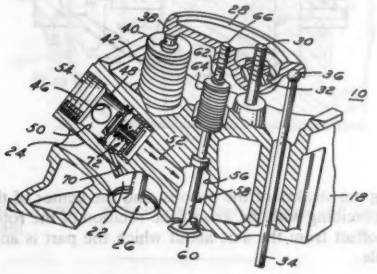
responding to the direction of movement of the moving heat source.

3,630,021

INTERNAL COMBUSTION ENGINE INCLUDING MEANS FOR REDUCING EMISSIONS

Irving N. Bishop, 32046 Bonnet Hill, Farmington, Mich.

Filed June 2, 1970, Ser. No. 42,643
Int. Cl. F01n 3/10
U.S. Cl. 60—30 R 11 Claims



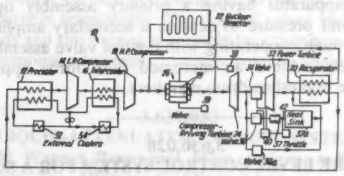
An internal combustion engine having a combustion cylinder with a piston reciprocably mounted therein and a head positioned over the combustion chamber. The cylinder head has an exhaust passage positioned therein communicating with the combustion chamber and an exhaust valve positioned in the exhaust passage. Means are provided in the cylinder head and communicating with the exhaust passage and the combustion chamber for injecting air under pressure into the exhaust passage and into the combustion chamber during the expansion of the piston after the exhaust valve is opened and during the exhaust stroke. This means includes means for either continuously injecting air under pressure into the exhaust passage or for sequentially injecting air first into the exhaust passage and then into the combustion chamber subsequent to the opening of the exhaust valve.

3,630,022

GAS TURBINE ENGINE POWER PLANTS

Albert Jubb, Kenilworth, Warwickshire, England, assignor to Rolls Royce Limited, Derby, England

Filed Sept. 11, 1969, Ser. No. 857,026
Claims priority, application Great Britain, Sept. 14, 1968, 43,819/68
Int. Cl. F01k 13/02
U.S. Cl. 60—36 8 Claims



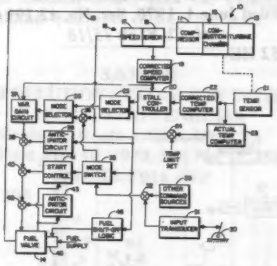
A closed-cycle gas turbine engine power plant employing a nuclear reactor to heat its working fluid, helium, is provided with a bypass valve whereby a variable amount of the helium compressed by the compressor or compressors may be caused to bypass the nuclear reactor and flow directly to the inlet of the turbine or turbines, thus enabling the turbine inlet temperature, and therefore the power output of the power plat, to be varied much more quickly than can be achieved by varying the heat output of the nuclear reactor.

3,630,023

FLUIDIC ENGINE CONTROL APPARATUS

Jeffrey M. Lazar, South St. Paul, and Robert R. St. John, North St. Paul, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Oct. 24, 1968, Ser. No. 770,446
Int. Cl. F02c 9/04, 3/00
U.S. Cl. 60—39.28 14 Claims



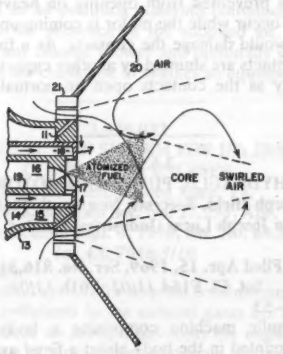
A fluidic gas turbine engine control system comprising a speed error circuit, a temperature error circuit, a stall error circuit and a control circuit. The speed, temperature and stall error circuits provide error signals indicative of the difference between (1) engine speed and a reference speed, (2) actual engine temperature and a maximum temperature limit, and (3) an engine stall signal and a stall reference signal. The error signals are supplied to the control circuit which controls fuel flow to the engine in response to only that one of the signals which commands the smallest fuel flow.

3,630,024

AIR SWIRLER FOR GAS TURBINE COMBUSTOR

Edward P. Hopkins, Schenectady, N.Y., assignor to General Electric Company

Filed Feb. 2, 1970, Ser. No. 7,947
Int. Cl. F02c 3/22, 7/00
U.S. Cl. 60—39.69 4 Claims



An air swirler is provided in the head end of a gas turbine combustor such that, when reducing the smoke production,

the flame will be stabilized and proper mixing of the combustion air and fuel will occur. The proper amount of swirl and airflow must necessarily be provided. Also provided in the air swirler are air sweeper holes which direct part of the combustion air across the face of the fuel nozzle, thereby preventing the buildup of carbon particles. Yet a further provision in the air swirler are gaseous fuel holes such that gaseous fuel may be burned by directing the fuel into the air swirler slots so that it is properly mixed with the combustion air.

3,630,025

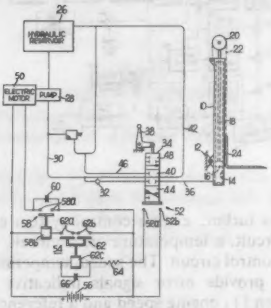
CONTROL SYSTEM FOR HYDRAULIC DEVICES

Luke F. Henry, Homewood, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed June 1, 1970, Ser. No. 42,199

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 HE **4 Claims**



A control system for a hydraulic ram carried on a forklift truck comprises a manually operable control valve which controls fluid flow between a fluid reservoir and the ram. Moving the valve to open (raise) position permits fluid to flow from the reservoir to the ram and simultaneously closes an electric switch which effects, through a relay and a contactor, closure of the contacts of a motor controller which connect an electric pump motor to a battery. The pump supplies pressurized fluid from the reservoir to the ram. Closure of the switch also energizes a capacitor which discharges to maintain the relay energized and the motor controller contacts closed until the pump motor gets up to full speed, even though the valve is moved from open (raise) position and the electric switch is opened. By this means the motor controller contacts are prevented from opening on heavy inrush currents which occur while the motor is coming up to full speed and which would damage the contacts. As a further protection, the contacts are shunted by another capacitor which absorbs energy as the contacts open on normal line current conditions.

3,630,026

HYDRAULIC PUMPS AND MOTORS

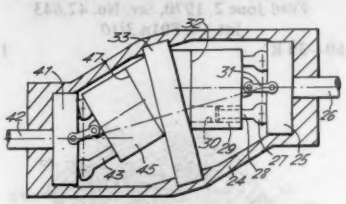
Richard Joseph Ifield, Beecroft, New South Wales, Australia, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Apr. 15, 1969, Ser. No. 816,313

Int. Cl. F16d *31/02;* **F01b** *13/04*

U.S. Cl. 60—53 **4 Claims**

An hydraulic machine comprising a body, a member rotatably mounted in the body about a fixed axis, a plurality of pistons connected to the member by respective universal joints, a rotor having a plurality of bores within which the pistons are slidably engaged, the opposite end of the rotor from which the pistons enter being in facial contact with a ported surface on a part which is angularly movable in the body, about an axis which is inclined to the axis of the member, and is also inclined with respect to a plane which is perpendicular to said surface, angular movement of the part



varying the strokes of the pistons, and the center of the surface coinciding with the axis of the rotation of the rotor, and being offset from the axis about which the part is angularly movable.

3,630,027

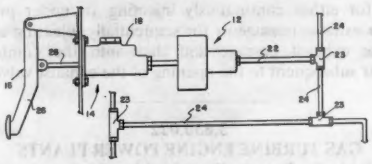
HYDRAULIC LINEAR AMPLIFIER APPARATUS FOR POWER BRAKE STRUCTURES

Andrew A. Lambert, 1768 Harding Street, Wichita, Kans.

Filed Aug. 18, 1969, Ser. No. 850,847

Int. Cl. F15b *7/00;* **F16k** *31/12*

U.S. Cl. 60—54.6 A **2 Claims**



This invention is hydraulic linear amplifier apparatus operable through fluid or direct mechanical linkage structures to provide an increased hydraulic force for application against brakeshoe structures from a given available actuator force. More particularly, this invention is a hydraulic linear amplifier apparatus having a primary assembly operable through fluid pressure to actuate a secondary amplifier assembly through cooperating with control valve assemblies to progressively achieve an increased fluid force applied to operate the brakeshoe drum members.

3,630,028

PRESSURE LEVEL CONTROL SYSTEM FOR A SOLID PROPELLANT ROCKET MOTOR

Leonard H. Caveny, 23 Galston Drive RD #4, Trenton, N.J.

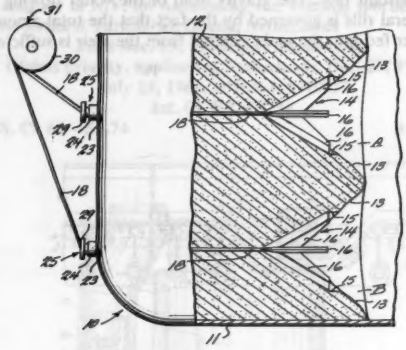
Continuation-in-part of application Ser. No. 720,923, Apr. 12, 1968, now abandoned. This application Dec. 1, 1969, Ser. No. 881,062

Int. Cl. F02k *9/04*

U.S. Cl. 60—234 **14 Claims**

A system for controlling the operating pressure and thrust of a solid propellant rocket motor which includes a propel-

lant cutter that extends through the burning surface of the solid propellant to increase on command the burning surface

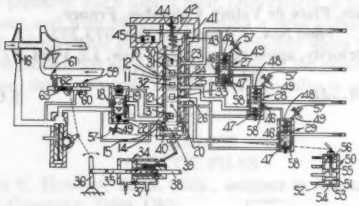


area and thereby increase the burning rate of the solid propellant.

3,630,029
FUEL CONTROLS FOR REHEAT SYSTEMS OF GAS TURBINE ENGINES

Trevor Stanley Smith, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 14, 1970, Ser. No. 2,905
Int. Cl. F02k *3/10*
U.S. Cl. 60—243 **16 Claims**



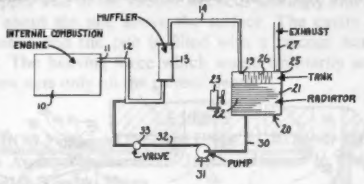
The invention relates to an apparatus for controlling fuel flow to the burners of the reheat system of a gas turbine engine. The apparatus comprises a main control valve through which all the said fuel flow passes and which has a number of outlets from which fuel passes to associated burners. Control valves in all but one of the lines connecting the main control valve to the burners are arranged to operate in response to the fuel flow in the next preceding line so that fuel is supplied to the burners sequentially. The control valves include biasing means and this biasing is variable by a common actuating device responsive to pressure signals from the engine.

3,630,030
LIQUID-ATTENUATED EXHAUST SYSTEM

Wayne M. Wagner, Rosemount, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Feb. 9, 1970, Ser. No. 9,536
Int. Cl. F01n *3/04*
U.S. Cl. 60—274 **6 Claims**

Apparatus and method for injecting droplets of a liquid such as water into the exhaust pipe of an internal combustion engine, passing the mixture of exhaust gases and liquid droplets through a muffler, removing the liquid from the exhaust gases and cooling and recirculating the liquid. The liquid droplets mixed with the exhaust gases greatly

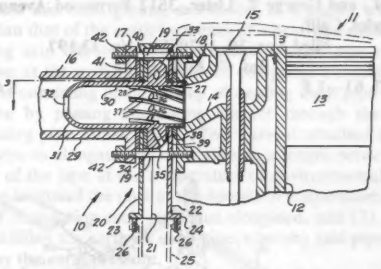


decreases the exhaust noise, cool the exhaust gases, and remove substantial quantities of solid particles.

3,630,031
ANTIPOLLUTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Lewis M. D. Grainger, Route 1, Glen Allen, Va.

Filed Apr. 10, 1970, Ser. No. 27,251
Int. Cl. F01n *3/10*
U.S. Cl. 60—305 **6 Claims**



An antipollution system for internal combustion engines in which the air pollutants in the exhaust gases are completely burned to produce an exhaust gas from the engine which is substantially free of air-polluting materials. An air injector is positioned in the exhaust stream to provide the necessary oxygen to burn the pollutants. The exhaust gases are fed through an air injector and combustion chamber unit which is heated by the exhaust gases and remains at a relative high temperature while the engine is operating so as to complete the burning of all air-polluting materials contained in the exhaust gases in the presence of the supplied air. The air is forced-fed by any desired blower and optionally includes air extracted from the crankcase in engines so equipped.

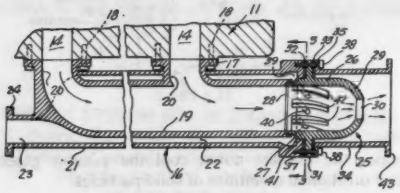
3,630,032
ANTIPOLLUTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Lewis M. D. Grainger, Route 1, Glen Allen, Va.

Continuation of application Ser. No. 27,251, Apr. 10, 1970. This application Sept. 4, 1970, Ser. No. 69,866
Int. Cl. F01n *3/10*
U.S. Cl. 60—308 **6 Claims**

An antipollution system for internal combustion engines in which the air pollutants in the exhaust gases are completely burned to produce an exhaust gas from the engine which is substantially free of air polluting materials. An air injector is positioned in the exhaust stream to provide the necessary oxygen to burn the pollutants. The exhaust gases are fed through an air injector and combustion chamber unit which

is heated by the exhaust gases and remains at a relatively high temperature while the engine is operating so as to complete the burning of all air polluting materials contained in the exhaust gases in the presences of the supplied air. The air is forced fed by any desired blower and optionally includes air extracted from the crank case in engines so equipped. The air may be preheated by contact with the exhaust manifold in one form of the invention and may be entrained with the exhaust gases before reaching the combustion chamber unit in another form of the invention.

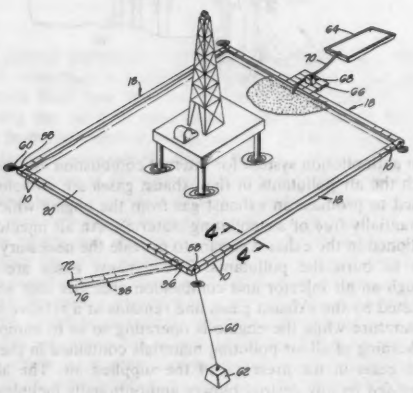


3,630,033

APPARATUS FOR CONTROLLING OIL SLICKS

Ralph L. Tuttle, 7135 Hollywood Boulevard, Hollywood, Calif., and George T. Lister, 3511 Fernwood Avenue, Los Angeles, Calif.

Filed Apr. 30, 1970, Ser. No. 33,197
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **5 Claims**



An apparatus for controlling oil slicks which incorporates a plurality of modular flotation tanks joined together to form a closed structure, with a large gate therein to allow the structure to be positioned around an oil slick and control curtains extending vertically downward from the structure beneath the surface of the water and around the oil slick.

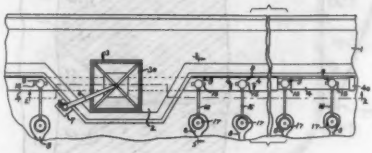
3,630,034

IRRIGATION CANAL TAPOFF SYSTEM

Carrol G. Whitlock, 841 Grand Drive, Moses Lake, Wash.

Filed Feb. 24, 1970, Ser. No. 13,393
Int. Cl. E02b *13/00*
U.S. Cl. 61—12 **4 Claims**

For tapping off water for a multiplicity of lateral rills from an irrigation canal, a weir is established in a basin in the canal whereby water can be drawn off and discharged downwardly in the desired quantity. The water is fed from the weir outlet into an elongated main conduit which is fitted at short intervals with metering caps operable to deliver measured flow of water to conduits individual to the lateral rills at a constant rate. The gravity head of the water flowing to the lateral rills is governed by the fact that the total amount of water fed into the main conduit from the weir is sufficient to keep it full at all times. With this system the individual conduits for the rills are buried in the ground and have their outlet ends entering the bottom of individual wells or cups at the heads of the rills, thus inserting actual delivery of the desired amount of water into each rill. The metering caps assure substantially exact supply to the individual lateral rills. The main conduit preferably is sectional and the sections are successively smaller as they are further away from the weir.

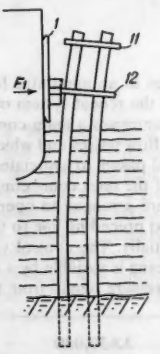


3,630,035

BARRIER WHICH MAY BE USED FOR THE PROTECTION OF HARBOR INSTALLATIONS

Roland Charles Wanneroy, Paris, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber Colombes, Place de Valmy, Colombes, France

Filed Nov. 3, 1969, Ser. No. 873,272
Claims priority, application France, Nov. 13, 1968, 173622
Int. Cl. E02b *3/22*
U.S. Cl. 61—46 **5 Claims**



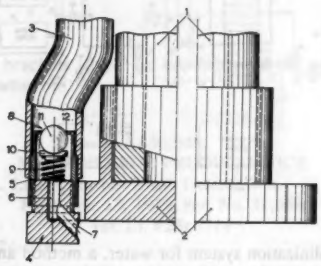
A barrier, which may be used for the protection of harbor installations, is provided with a tiltable impact member and resilient means is arranged in horizontal and vertical planes in a mounting for the member so that the forces tending to tilt the barrier act in shear on the resilient means.

3,630,036

ELONGATED ELEMENT TO BE DRIVEN INTO THE GROUND TOGETHER WITH A SHOE

Abraham Francois Van Weele, Waddinxveen, Netherlands, assignor to N.V. tot Aanneming van Werken voorheen H.J. Nederhorst Turfmarkt, Gouda, Netherlands

Filed Dec. 19, 1969, Ser. No. 886,700
Claims priority, application Netherlands, Dec. 20, 1968, July 15, 1969; 6818364, 6910827
Int. Cl. E02d 7/24
U.S. Cl. 61—53.74 3 Claims



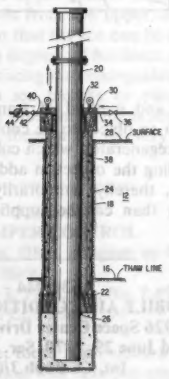
An elongated element, such as a foundation pile or a tube for casting a concrete foundation pile in situ, adapted to be driven in the ground, in particular by vibration, together with a shoe, and comprising at least one supply pipe connected with the outer wall of the element, extending in the longitudinal direction of the same, terminating near the lower end of the element, and connectable at its top, through a supply valve, to a source of a pressure medium, in particular water under pressure. Each supply pipe, respectively, is provided at its lower end with means preventing a penetration of earth into the supply pipe substantially completely when the supply valve is closed, but allowing a discharge of the pressure medium from the supply pipe when the supply valve is open.

3,630,037

ARCTIC PILES

George C. Howard, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed July 15, 1970, Ser. No. 54,985
Int. Cl. E02d 5/60, 31/08
U.S. Cl. 61—54 12 Claims



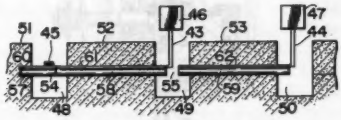
Piles are used quite widely in the Arctic to support buildings and structures. However, in many areas the piles are forced upwardly by the thawing and refreezing of the surrounding earth. I solve this problem of pile heaving by placing a rubberlike sleeve around the pile. The lower end of the rubber sleeve is fastened to the pile below the thaw zone. The upper end of the rubber sleeve is sealingly and slideably fitted about the pile above the surface. The cavity between the sleeve and the pile is filled with a viscous nonfreezing liquid. The heaving force which would ordinarily act on the pile now acts only on the rubber sleeve.

3,630,038

METHOD FOR LAYING AN UNDERGROUND PIPELINE

Masao Ando, Yokohamashi, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed Sept. 28, 1970, Ser. No. 75,918
Claims priority, application Japan, Oct. 16, 1969, 44/82717
Int. Cl. F16l 1/00; F24h 1/14; F16l 53/00
U.S. Cl. 61—72.1 5 Claims



A method for laying underground a long-distance pipeline, such as a transportation pipeline for heavy oil, which is used in a state laid underground and heated to a higher temperature than that of the earth by means of a heat-generating pipe utilizing skin effect current, attached to each pipe of said pipeline, at the working time, which comprises a combination of steps consisting of (1) a step of heating each pipe of the pipeline by passing alternating current through the heat-generating pipe utilizing skin effect current attached to said each pipe to elongate said each pipe, to a length between the length of the pipe at the temperature of environmental earth and the length of the pipe at the operation temperature, (2) a step of connecting each pipe thus elongated, and (3) a step of backfilling the earth on each pipe, whereby said pipeline is fixed by the earth pressure.

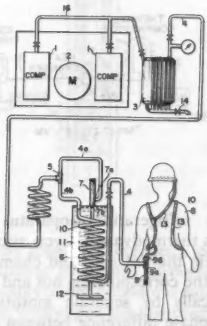
Thus, failure of pipe due to expansion stress can be prevented without attaching any expansion joint or bend.

3,630,039

INDIVIDUAL COOLING DEVICE

Toshiyuki Hayashi, Soka, Japan, assignor to Midori Safety & Industry Co., Ltd., Tokyo, Japan

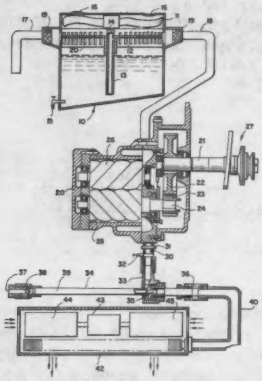
Filed Mar. 3, 1970, Ser. No. 16,040
Claims priority, application Japan, Mar. 10, 1969, Mar. 10, 1969, Mar. 10, 1969, Mar. 10, 1969, May 17, 1969; 44/17535, 44/17536, 44/17537, 44/17538, 44/38212
Int. Cl. F25b 9/02
U.S. Cl. 62—5 5 Claims



Device for cooling particular individual workers in a hot workshop or other working place by means of the expansion

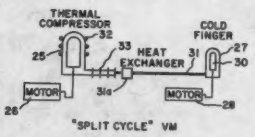
of air, a heat exchanger and the separation of portions at different temperatures.

3,630,040
AIR CONDITIONER
Fred A. Goldfarb, 143 Jewett Avenue, Jersey City, N.J.
Filed June 12, 1970, Ser. No. 45,606
Int. Cl. F25b *9/02*
U.S. Cl. 62—5 **8 Claims**



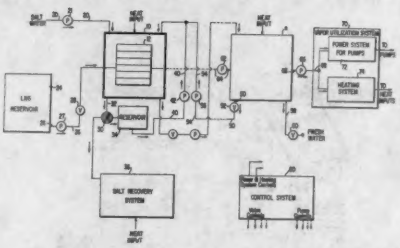
An air conditioner for a vehicle having an air washer and filter for supplying moisturized clean air to a screw-type of compressor which compresses the air and feeds it to a vortex tube. The cold-air outlet from the vortex tube is connected to a heat exchanger to enable the cold air passed from the vortex tube to the heat exchanger to ultimately cool the vehicle cabin.

3,630,041
THERMODYNAMIC REFRIGERATOR
Alexander Daniels, Briarcliff Manor, and Frits Karel du Pre, White Plains, both of N.Y., assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 25, 1970, Ser. No. 14,040
Int. Cl. F25b *9/00*
U.S. Cl. 62—6 **12 Claims**



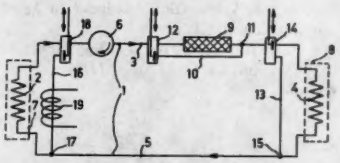
A cryogenic refrigeration apparatus operable in accordance with a thermodynamic cycle such as the Vuilleumier cycle, wherein the hot and cold chambers are physically separated, and the corresponding hot and cold displacers are driven reciprocally by separate motors. Proper pressure variations and phase difference between the motions of the displacers and the gas transported are maintained preferably by synchronizing the speeds of the different motors.

3,630,042
METHOD AND SYSTEM FOR DESALINIZATION OF WATER
Robert E. Petsinger, Upper St. Clair, Pa., assignor to Ling Services, Pittsburgh, Pa.
Filed Feb. 7, 1969, Ser. No. 797,461
Int. Cl. B01d *9/04*
U.S. Cl. 62—58 **5 Claims**



In a desalinization system for water, a method and system are provided employing liquified natural gas as a source of refrigeration and as a fuel for various power and heat generation functions. In each of a series of stages, the input salt water mixture is purified by freezing and the still brine liquid drawn off, with the frozen water then melted and recovered. The recovered water is advanced through successive stages for similar processing from the last stage of which purified water is obtained.

3,630,043
COLD TRANSPORTING DEVICE
Jan Mulder, Emmasingel, Eindhoven, Netherlands
Continuation of application Ser. No. 830,440, Apr. 30, 1969. This application May 18, 1970, Ser. No. 48,794
Int. Cl. F25d *17/02*
U.S. Cl. 62—99 **12 Claims**

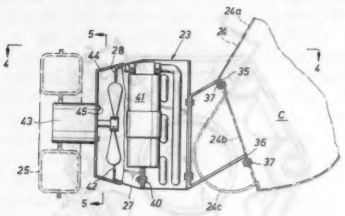


An apparatus and method of transporting cold from a source of cold to an object to be cooled, with a quantity of cold stored in a regenerator, which cold can subsequently be used during cooling the object in addition to the cold from the cold source, thereby temporarily providing a greater cooling capacity than can be supplied by the cold source alone.

3,630,044
AUTOMOBILE AIR CONDITIONING SYSTEM
Don P. Dixon, 4926 Space Center Drive, San Antonio, Tex.
Filed June 29, 1970, Ser. No. 50,368
Int. Cl. B60h *3/04*
U.S. Cl. 62—243 **2 Claims**

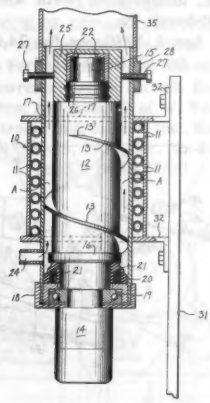
An air conditioning system for a "fast back" or "square back" Volkswagen automobile including a condenser as-

sembly supported behind the spare tire compartment by



means of brackets which are connected to the rear wall of the compartment.

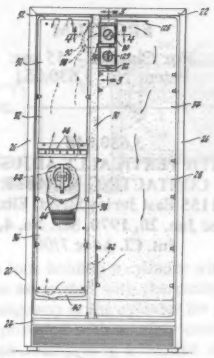
3,630,045
MACHINES FOR PRODUCING ICE
Howard L. Lunde, Harbor Road, Oconto, Wis.
Filed Apr. 24, 1970, Ser. No. 31,666
Int. Cl. F25c *1/14*
U.S. Cl. 62—320 **10 Claims**



A machine for producing ice for use in cold drinks and the like which machine is adapted to accommodate interchangeable augers wherein the upper ends of the auger blades are located varying distances from the upper, discharge end of the freezing chamber so that the ice can be discharged from said chamber in varying degrees of hardness, depending upon its intended use, and utilizing interchangeable augers of varying diameters to form ice chunks or pieces of different desired thicknesses, and which machine is adapted to have an elongated tube secured thereon for delivery of the ice to a remote location.

3,630,046
DAMPER CONTROL
Roger M. Boor, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 2, 1970, Ser. No. 7,498
Int. Cl. F25d *17/04*
U.S. Cl. 62—408 **4 Claims**

In the preferred form, there is provided a horizontal duct through a vertical partition wall between compartments of a refrigerator. A plastic damper control unit is slidably mounted in this duct and has a scoop-type vane projecting into the air stream flowing from the evaporator compartment for diverting a proportion of the circulating air through the horizontal duct in the partition wall to the compartment on the opposite side of the wall. The opposite side of the wall is provided with a rotary control knob for moving the scoop vane to various positions providing rates of flow in proportion to the position of the knob. The damper control is a part of a unit which includes a thermostat control switch having a thermosensitive bulb extending into the air stream of the air discharged from the duct for controlling the operation of the refrigerating system and the temperature of the evaporating means.



3,630,047
CRYOGENIC COOLING APPARATUS
Frank Arnold Turton, Cofton, England, assignor to The Hymatic Engineering Company Limited, Redditch, Worcestershire, England
Filed Mar. 23, 1970, Ser. No. 21,602
Claims priority, application Great Britain, Mar. 25, 1969, 15,606/69
Int. Cl. F25b *19/00*
U.S. Cl. 62—514 **7 Claims**

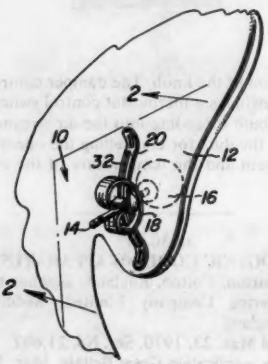
A cryogenic cooling apparatus includes a generally tubular heat exchanger affording two paths through one of which refrigerant from a supply under pressure is supplied to a pressure reducing nozzle, whereupon the low-pressure refrigerant returns through the other path, and a valve member cooperating with the nozzle to vary its effective area for au-

tomatically controlling the flow of refrigerant. The valve is controlled by a bellows through a hollow piston rod extending through at least the cold end part of the heat exchanger, and the hollow piston rod forms or carries a damping chamber containing particulate material, such as phosphor bronze balls or tungsten carbide powder for damping out vibrations of the valve member.

ERRATUM

For Class 62—55 see:
Patent No. 3,630,051

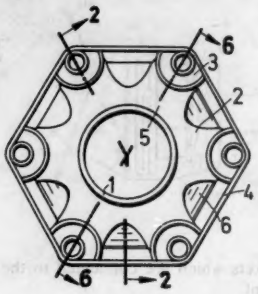
3,630,048
EARRING WITH VERTICALLY ADJUSTABLE LOBE CONTACTING MEMBER
Aaron Masters, 1155 East Jersey Street, Elizabeth, N.J.
Filed Jan. 20, 1970, Ser. No. 4,267
Int. Cl. A44c *7/00*
U.S. Cl. 63—12 **6 Claims**



A spring clip assembly is slidably mounted on an earring post and adapted for clamping into position along a selected point on the post. The clip has apertures therein to admit a bow-shaped arm which gently contacts the wearer's earlobe upon proper positioning of the spring clip. The bow-shaped arm has an elongated slot formed therein to allow its sliding displacement relative to the post so that the wearer can adjust the arm to a position affording the most even restraining force distribution on the lobe. By properly positioning the arm, the earring wearer is spared from painful force concentration.

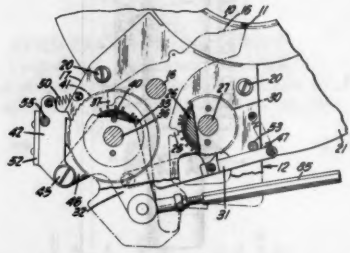
3,630,049
ELASTIC SHAFT COUPLING
Otto Feller, and Paul Vossieck, both of Burscheid, Germany, assignors to Goetzewerke Friedrich Goetze Aktiengesellschaft, Burscheid, Germany
Filed Mar. 16, 1970, Ser. No. 19,852
Int. Cl. F16d *3/78*
U.S. Cl. 64—13 **13 Claims**

An elastic shaft coupling for joining two approximately aligned shafts to compensate for possible shaft-misalignments and to damp torsional vibrations. An annular body of rubber is supported on its inner diameter by a relatively rigid support body. About the outer diameter of the annular rubber body are arranged securement elements for effecting attachment of the coupling to and between the approximately aligned shafts. A band encircles the body of rubber and presses the securement elements radially inwardly so that



columns of rubber existing between the securement elements and the support body are placed under compression.

3,630,050
PATERN MECHANISM FOR KNITTING MACHINES
Stephen G. Guresh, Robesonia, and Richard M. Janda, Reading, both of Pa., assignors to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Apr. 1, 1970, Ser. No. 24,673
Int. Cl. D04b *15/74*
U.S. Cl. 66—50 B **6 Claims**

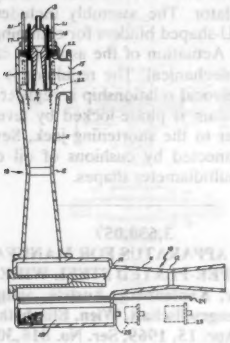


Jack selector control means for knitting machines having a rotatable cylinder for jacks and needles the selector control means including a first trick drum for operating the selectors to select the jacks and needles of the machine for operation, a second trick drum for individually moving the selectors from inactive to active positions to be operated by the first trick drum, indexing means for the first and second trick drums, means for activating the indexing means to index the trick drums and common means for actuating the indexing means in a plurality of indexing movements during a single rotation of the cylinder to index the first trick drum in each of the plurality of indexing movements and to index the second trick drum in only one of the plurality of indexing movements.

3,630,051
COLD TRAP ICE-REMOVAL MEANS FOR VACUUM DRYING SYSTEMS
David H. Martin, Raleigh, N.C., assignor to Graham Manufacturing Company, Inc., Batavia, N.Y.
Filed Feb. 19, 1970, Ser. No. 12,610
Int. Cl. B01d *5/00*
U.S. Cl. 62—55.5 **9 Claims**

In abstract, a preferred embodiment of this invention is a deicing device for cold traps used to remove condensable

vapors from vacuum chambers. The invention is particularly beneficial in maintaining constant maximum system efficiency during commercial type vacuum vapor removal or vapor reclamation associated with chemical processes or food processing.

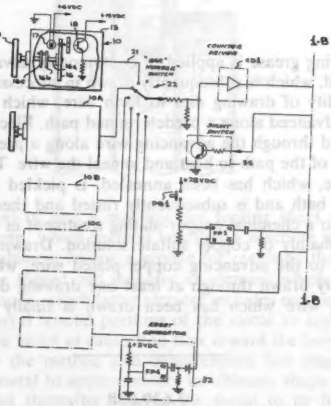


3,630,052

RUNNER-CHECKER APPARATUS WITH VARIABLE-SPEED MECHANISM

Raymond Baines Fertig, Ronceverte; Samuel Eugene Mitchell, Lewisburg; Lawrence Creigh Nickell, Ronceverte, and Ernest L. Eggleston, Alderson, all of W. Va., assignors to Appalachian Electronic Instruments, Inc., Ronceverte, W. Va.

Filed Oct. 15, 1970, Ser. No. 80,945
Int. Cl. D04b *27/00*
U.S. Cl. 66—86 9 Claims



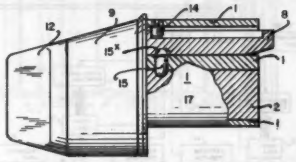
A runner checker for measuring and indicating the length of yarn being fed from the warp beam section of a warp-knitting machine, including a pulse generator mounted on each tension letoff controller assembly of a warp beam section to produce pulses related to unit lengths of warp yarn feed, a device connected to the pattern wheel drive shaft of the knitting machine for producing pulses related to pattern wheel rotation, and electronic circuitry responding to the pulses to indicate the yarn runner length in a rack of cloth. A variable speed-coupling is provided between the pulse generator and the drive wheel of the tension letoff controller.

3,630,053

SAFETY LOCK

Edwin G. Krakauer, 2 Turf Lane, Roslyn Heights, N.Y.

Filed Apr. 1, 1970, Ser. No. 24,604
Int. Cl. E05b *15/14, 27/06*
U.S. Cl. 70—421 4 Claims



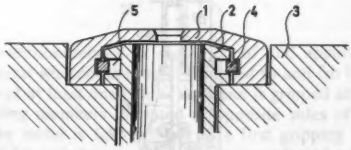
The casing of a lock holding a cylinder with the usual key-operated tumblers associated with the casing, and the usual key-receiving passageway in the cylinder for key operation of said tumblers, is provided with a safety combination against "picking" the lock, comprising a barlike element slidingly mounted in a passageway of the casing at the side of the cylinder, a bar-head and turn button carried by the barlike element and adapted to receive the finger end of a key, means limiting outward movement of the barlike element with the elements carried at its outer end, a safety lock tumbler movable in a passage in the casing and movable into a rounded seat in the cylinder wall, and into a like-rounded seat in the barlike element, in reverse movement, whereby in both outward and inward positions of the barlike element the cylinder is locked by said safety lock tumbler, and the cylinder face is blocked by the bar-head in the unlocking operation of the turn button, said safety lock tumbler locking the barlike member against outward movement from its "In" position until upon unlocking operation the key is returned to insert position with the cylinder.

3,630,054

PROTECTING CASE

Henrikki Malminen, Joensuu, and Kaarlo Henrik Solitanner, Helsinki, both of Finland, assignors to Oy Wartsila AB, Helsinki, Finland

Filed May 26, 1969, Ser. No. 827,830
Claims priority, application Finland, May 25, 1968, 1468/68
Int. Cl. E05b *15/02*
U.S. Cl. 70—452 4 Claims

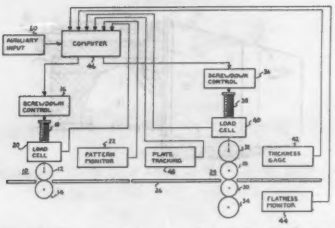


A protecting case is disclosed for the outer end of a cylinder lock which is mounted for instance in a door. The protecting case is attached to the cylinder housing of said lock by means of a yielding locking member which when the case is pushed in place, the member yields or is kept aside, but which when the case has reached its proper position is released and enters into an attachment recess so that it preferably undetachably locks the case to the cylinder housing. A radially yielding locking ring is preferred as the locking member.

3,630,055
WORKPIECE SHAPE CONTROL

Donald J. Fapiano, Scotia, N.Y., and Allyn S. Norton, Jr., Charlottesville, Va., assignors to General Electric Company

Filed May 14, 1969, Ser. No. 824,491
Int. Cl. B21b *37/00*
U.S. Cl. 72—6 9 Claims

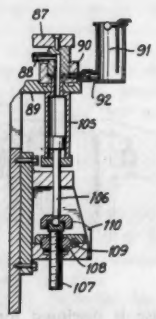


A method of controlling the shape of a workpiece in a single-stand, multipass rolling mill when the final gage and crown are specified. The roll-separating force required on each reducing pass is calculated as a function of (1) roll elasticity, diameter, and crown and (2) workpiece crown, resistance to deformation, and width. The per unit target crown for each pass n is calculated by multiplying the per unit target crown for pass $n+1$ (using the final per unit crown as the first pass $n+1$ per unit target crown) by a crown-slope multiplier greater than one. The multiplier is a function of final width and final gage and is subject to change in response to observations of the shapes of previously rolled workpieces. Also disclosed is pattern control through adjustment of rolling force levels.

3,630,056
METHOD AND ASSEMBLY FOR THE PRODUCTION BY HYDROFORMING OF PARTS OF LARGE SIZE, ESPECIALLY IN LENGTH

Pierre Cuq, 6 Rue Limouzin, Firminy, France

Filed July 1, 1969, Ser. No. 838,152
Claims priority, application France, July 4, 1968, Dec. 17, 1968, Apr. 9, 1969; 146, 257, 6909551
Int. Cl. B21d *26/04*
U.S. Cl. 72—28 9 Claims

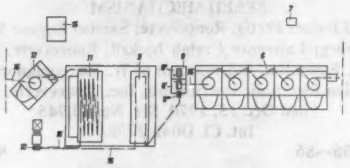


A method of forming blanks of stamped metal sheets, into a finished part by a combination of mechanical and hydraulic actions. The hydraulic action is strictly connected in synchronism and magnitude, according to a univocal relationship, with the mechanical action. This univocal relationship is defined by the variation of the internal volume of the part as a function of its shortening, enabling the surface of the part to be maintained constant from the blank up to the finished part. An assembly for performing this method with any press of normal power is actuated by the press by a double-acting oleohydraulic transmission having a master cylinder and regulator. The assembly includes a frame of parallel plate and U-shaped binders for clamping the opening parts of the mold. Actuation of the assembly can be electrical, hydraulic or mechanical. The regulator is a rotary cam upon which the univocal relationship is registered and which is calibrated. The cam is phase-locked by levers, cogs or a hydraulic multiplier to the shortening jack, Several concentric jacks interconnected by cushions of oil constitute the bending ram for multidiameter shapes.

3,630,057
PROCESS AND APPARATUS FOR MANUFACTURING COPPER-PLATED STEEL WIRE

Harald Strohmeier, Kapfenberg, Austria, assignor to Gebr. Bohler Co. Aktiengesellschaft, Wien, Elisabethstr., Austria

Filed Apr. 15, 1969, Ser. No. 816,304
Claims priority, application Austria, Apr. 19, 1968, A 3808/68
Int. Cl. B21b *45/00*; B21c *9/00*
U.S. Cl. 72—47 10 Claims



Drawing grease is applied to continuously advancing steel wire rod, which is subsequently drawn in succession through a plurality of drawing dies to form wire, which is continuously advanced along a predetermined path. Electric current is passed through the advancing wire along a predetermined portion of the path to heat and anneal the wire. The advancing wire, which has been annealed, is pickled in an electrolytic bath and is subsequently rinsed and thereafter subjected to a chemical copper-plating treatment in a bath consisting mainly of copper sulfate solution. Drawing grease is applied to the advancing copper-plated wire, which is subsequently drawn through at least one drawing die. The advancing wire which has been drawn is finally wound on spools.

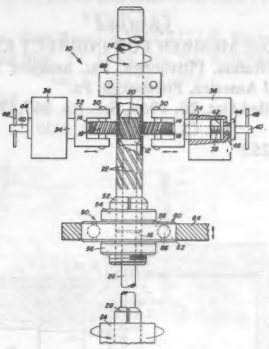
3,630,058
PROCESS AND APPARATUS FOR FORMING TUBES WITH SPIRAL CORRUGATIONS

Vilmer H. Kiplinger, Concord; Marshall H. Hickey, Knoxville, both of Tenn., and Roy E. Reed, Jr., deceased, late of Concord, Tenn. (by Frances E. Reed, administratrix), assignors to The United States of America as represented by the Secretary of the Interior

Filed Jan. 27, 1970, Ser. No. 6,184
Int. Cl. B21d *15/04*
U.S. Cl. 72—96 11 Claims

A spirally corrugated heat exchange tube is formed from a smooth-walled tube. The smooth-walled tube is drawn over a rotating mandrel between spirally fluted rotary dies. As the

tube rotates with the mandrel, the newly corrugated portion is drawn away from the mandrel and dies, and a smooth-



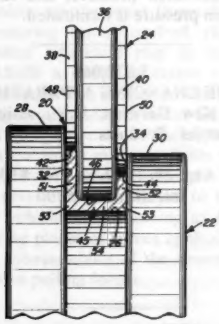
walled portion is advanced, forming continuous spiral corrugations along the length of the tube.

3,630,059

METHOD OF AND MACHINE FOR SHAPING METAL TO FORM A FLANGE

Neville T. Henkel, 9582 Labradore Lane, El Cajon, Calif.

Filed June 23, 1969, Ser. No. 835,493
Int. Cl. B21b *15/00;* B21d *1/02*
U.S. Cl. 72—177 12 Claims



A method of and a machine for forging sheet metal at bends therein, which method employs a machine which includes an element having a groove for receiving the heated metal to be forged and includes an element which extends into the groove, which latter element includes sections which engage several spaced portions of the metal to apply pressures on the metal to cause it to flow toward the bend. More specifically the method also comprehends first shaping the flat sheet metal to approximately its ultimate shape by cold working and thereafter heating the metal to its forgeable temperature before subjecting it to the aforementioned forging machine.

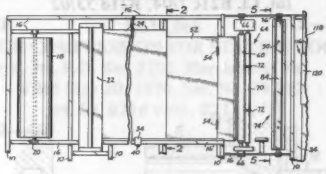
3,630,060

APPARATUS FOR PROCESSING SHEET METAL

Jerald G. Fleming, 2317 Waverly Drive South, Albany, Oreg.

Filed June 5, 1969, Ser. No. 830,674
Int. Cl. B21b *1/00, 39/20*
U.S. Cl. 72—203 16 Claims

A frame supports sheet metal vertically for movement sequentially through vertically disposed sheet metal shearing, rolling, bending, edge-forming and cutoff components. The bending component includes a resilient plastic female die bar and a cooperating metal male die bar and notching cutter and is mounted for pivotal movement on a vertical axis dur-



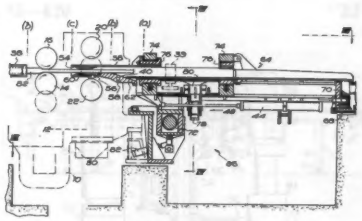
ing the bending operation. The forming and cutoff component is supported for vertical movement and for rotation to afford edge-forming selectively of vertical and horizontal edges of sheet metal.

3,630,061

ROLLING MILL APPARATUS AND METHODS OF ROLLING METAL

Alexander Ian Wilson, Sheffield, England, assignor to The Hille Engineering Company Limited, Sheffield, England

Filed Oct. 17, 1969, Ser. No. 867,226
Claims priority, application Great Britain, Oct. 23, 1968, 50,408/68
Int. Cl. B21b *39/14*
U.S. Cl. 72—222 22 Claims



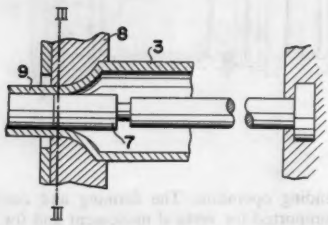
The invention relates to a method of and apparatus for rolling metal wherein the metal is passed to and fro between the rolls of at least one pair of rolls and is gripped alternately by gripping members mounted at opposite sides of the roll pass. The metal is first gripped in a first gripping member mounted for reciprocating movement towards and away from one side of the rolls and is thus entered into the pass by movement of said gripping member towards the rolls. The metal is then received at the other side of the pass in a second gripping member mounted on that side of the pass for reciprocating movement towards or away from the rolls; the metal moves lengthwise in the direction of rolling relative to the second gripping member until free of the rolls. The metal is thereupon gripped in said second gripping member and is then reentered between the rolls (into the same or another pass) by movement of the second gripping member back towards the rolls and is again received at the first mentioned side of the rolls in the first gripping member.

3,630,062

METHOD OF MANUFACTURING FIN METAL TUBING

Masaharu Odaki; Takashi Konno; Tatsuya Mochizuki; Osamu Nakahara, and Makoto Hashimoto, all of Kawasakishi, Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed July 9, 1969, Ser. No. 840,249
Claims priority, application Japan, July 13, 1968, 43/48845
Int. Cl. B21c *1/04;* B21d *53/02*
U.S. Cl. 72—278 10 Claims



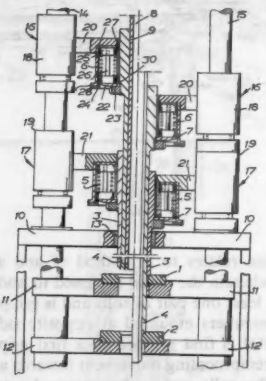
An ordinary cylindrical metal tube is formed into an intermediate tubing having thicker wall portions at which fins are to be formed subsequently, and the intermediate tubing is then subjected to a cold drawing operation by using a finlike die and a cylindrical plug so as to form fins from the thicker wall portions.

3,630,063

DEEP DRAWING HYDRAULIC PRESS

Victor Marcilger, Essen, Germany, assignor to S.T.D. Services Limited, Birmingham, England

Filed July 16, 1969, Ser. No. 842,324
Claims priority, application Germany, July 17, 1968, P 17 52 800.6
Int. Cl. B21d *22/28*
U.S. Cl. 72—349 5 Claims



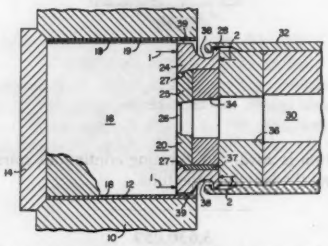
The present invention relates to a deep drawing hydraulic press having a composite telescopic punch, which consists of an inner punch and at least one tubular punch concentrically surrounding the inner punch, in which press between the hydraulic driving mechanism and the tubular punches, flexible intermediate members standing under an initial tension and a force transmitting element are arranged, which during a drawing stroke of the press, produce a connection between the driving mechanism and the tubular punches, a stop being provided in the forward path of the composite punches which shortly before the punch reaches a subsequent and smaller die, cuts off the hydraulic drive form the respective punch.

3,630,064

FLEXING DIE MEMBER FOR INDIRECT EXTRUSION

Maurice W. Mahns, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 20, 1969, Ser. No. 867,492
Int. Cl. B21c *23/00, 3/00*
U.S. Cl. 72—253 6 Claims



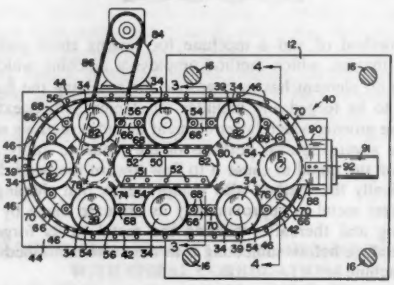
An extrusion process and apparatus in which a die member is provided with an annular recess in the periphery thereof. The recess permits radial expansion of the front portion thereof when the member and extrusion material are forced together under extrusion pressure, and radial contraction when the extrusion pressure is terminated.

3,630,065

DIE CHANGING APPARATUS

Alois J. Moos, Kew Gardens, N.Y., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Aug. 28, 1969, Ser. No. 853,675
Int. Cl. B21c *23/00*
U.S. Cl. 72—263 7 Claims



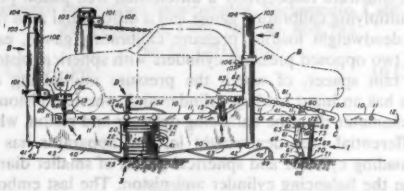
Apparatus particularly suited for changing dies in extrusion presses having a ram movable along a path. The apparatus includes a guide track which intersects the path of movement of the press ram. A plurality of die holders are mounted for movement in the guide track. Means are provided for selectively driving the holders along the guide track to being desired ones into alignment with the ram and means are provided for locking the holders in position.

3,630,066

APPARATUS FOR RETURNING VEHICLE BODY AND FRAME COMPONENTS TO THEIR ORIGINAL LOCATIONS DURING REPAIR AND SERVICING OF VEHICLES

Finis L. Chisum, Star Route A, Box 1721 E, Spenard, Alaska

Filed Mar. 27, 1969, Ser. No. 810,940
Int. Cl. B21d *11/04*
U.S. Cl. 72—305 8 Claims



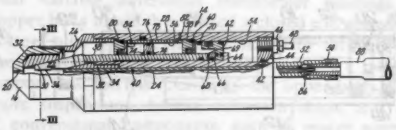
Apparatus is provided to apply pulling forces from any direction from any elevation around a vehicle being repaired and/or serviced. The apparatus is arranged so personnel using it are concerned with minimal physical lifting movements and minimal setup arrangements of the apparatus. Each embodiment of the apparatus utilizes at least one tower assembly equipped with an elongating subassembly to move a tension member, through directional change devices, as it remains secured to some portion of a vehicle, thereby undergoing at least one repositioning pull in a direction opposite to at least one prior force that previously caused some of the damage and/or misalignment Depending on the magnitude of the restoring force required, the tower, other towers, and/or other structures may be secured together and/or to the vehicle as well, to create a firm basis for anchoring the apparatus and/or the vehicle as one or more reactive forces are controllably created. Depending on the anticipated use of the apparatus and the capital expenditures to be made, the apparatus is made available in different embodiments, ranging from a sole location of a tower to multiple locations of several towers related to overall reactive structures and/or vehicle ramps serving as mutual multiple holding or anchoring places of forces applied to the vehicle, as the elongating subassemblies of the towers are moved to create the restorative pulling forces.

3,630,067

FLUID PRESSURE OPERATED HEAD FOR SETTING MANDREL RIVETS

James N. Henshaw, Sutton Coldfield, England, assignor to USM Corporation, Flemington, N.J.

Filed Apr. 30, 1970, Ser. No. 33,273
Claims priority, application Great Britain, May 10, 1969, 23,895/69
Int. Cl. B21d *9/05, 31/00*
U.S. Cl. 72—391 4 Claims



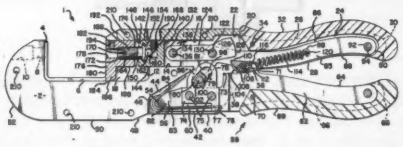
A fluid pressure operated tool, is disclosed for setting blind rivets by pulling and breaking their mandrels. In addition to including means for ejecting the spent mandrel portion, the rivet head has mechanism for ensuring that its mandrel gripping jaw close prior to exerting substantial mandrel tension, open at the end of the mandrel pulling stroke, and allow reloading of the head with retention of the next mandrel rivet to be installed.

3,630,068

HIGH COMPRESSION FOR STAKING TOOL

Edwin Floyd, Jr., P.O. Box 2201, Harrisburg, Pa.

Filed May 20, 1970, Ser. No. 39,692
Int. Cl. B21d *9/08;* B21j *9/18*
U.S. Cl. 72—410 8 Claims



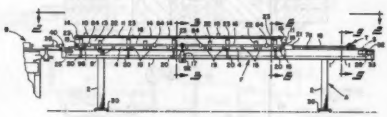
A staking tool wherein staking dies are compressed by a toggle linkage having unequal arms pinned to each other about a common pivot point, the longer toggle arm being further provided with a cam matingly slidable on a cam follower pivoted in an arcuate motion by a manually actuated handle. The staking dies may be adjusted for selecting variable staking pressure, and a positive stop is provided to prevent undesired excessive staking compression.

3,630,069

FEEDER FOR SMALL DIAMETER BARS

Frank F. White, Shaker Heights, Ohio, assignor to Automation Development Corporation, Mentor, Ohio

Filed Apr. 13, 1970, Ser. No. 27,735
Int. Cl. B23g *11/00*
U.S. Cl. 72—420 22 Claims



A bar feeder especially designed to handle bars and tubes of widely varying diameters, including those of very small diameter, and having an escapement mechanism of simple inexpensive construction, an improved box beam frame construction and a novel feeding system wherein gripping jaws grip and locate the end of each bar near the beginning and end of each cycle to assist the feed fingers in gripping the bar and in releasing the remnant and to assure proper positioning of the bar relative to the conveyor. A novel retractable stop is provided to stop the pusher so that the remnant is gripped while the feed fingers are still a few inches from their retracted positions.

3,630,070

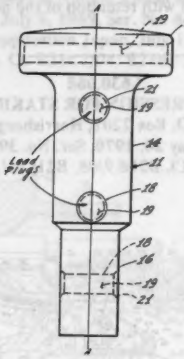
RIVET UPSETTING TOOL

Morton Mendels, Torrance, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Mar. 11, 1970, Ser. No. 18,448
Int. Cl. B21j *15/38*
U.S. Cl. 72—479 5 Claims

Upsetting tools, fabricated of at least two dissimilar metals, especially useful in bucking rivets utilized in attaching com-

ponents to panels, metal plates and like articles, functioning to reduce the impact wave occurring in the tool and reverberation thereof and reducing the accompanying noise level originating in and emitting from the panel etc.



3,630,071

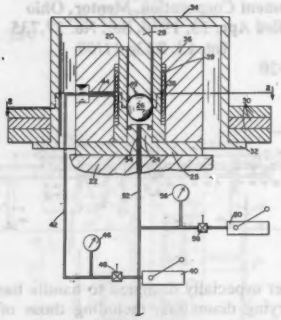
FREE PISTON GAUGING APPARATUS

Donald Harwood Newhall, Norfolk, Mass., assignor to Harwood Engineering Company, Walpole, Mass.

Filed Apr. 30, 1969, Ser. No. 820,466

Int. Cl. G01l *7/16, 27/00*

U.S. Cl. 73—4 D **10 Claims**



A free piston gauging apparatus having pressure cylinders and pistons with spherically formed cylinder wall engaging surfaces providing a line contact between the piston and cylinder wall. The apparatus includes a pressure cylinder closed at one end and open at the other end, a piston having a spherically shaped piston-to-cylinder contact surface which provides a line contact between the piston and cylinder wall, said piston being freely movable axially and in rotation within the cylinder and providing a sharp pressure drop across the transverse diameter of the spherically formed piston from the closed end to the open end of the cylinder, a ram extension of said piston, which may be separate or integral with the piston, loosely fitted into the open end of the cylinder, means for applying a loading force against the ram extension, a balancing pressure applied against the spherical piston through the closed end of the cylinder, and a gauge responsive to said balancing pressure.

The pressure cylinder may be jacketed for the application of external pressure which is adjustable with relation to the internal pressure to provide a controlled clearance between the cylinder and associated spherically formed piston.

Five embodiments of the invention are here shown. These embodiments include a simple free piston deadweight loading pressure calibrating gauge, and a force-measuring free piston gauge, each of these embodiments having a pressure cylinder and a spherical piston and ram assembly well adapted for the making of more accurate and reliable measurements than heretofore achieved. Two additional embodiments of the invention illustrate respectively a differential free piston pressure multiplying calibrating gauge and a differential area free piston deadweight loading pressure calibrating gauge, each having two opposed pressure cylinders with spherical pistons and a ram spacer, of which the pressure multiplying apparatus has an input loading cylinder and spherical piston of larger diameter than the balancing cylinder and piston, while the differential area deadweight loading apparatus has an input loading cylinder and spherical piston of smaller diameter than the balancing cylinder and piston. The last embodiment shown is a force-measuring gauge similar to that shown in FIGS. 3 and 4 of the drawings, of which the spherically formed cylinder wall engaging surfaces of the piston and the ram formed as an extension of the piston of smaller diameter are combined in a single element.

3,630,072

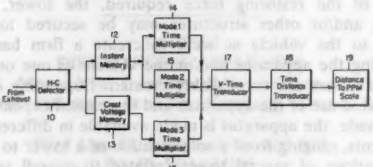
HYDROCARBON EMISSIONS COMPUTER

Alfred E. Traver, Great Neck, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,460

Int. Cl. G01n *23/02;* **G06g** *7/48*

U.S. Cl. 73—23 **9 Claims**



Method and apparatus for providing a hydrocarbon emission rating for an exhaust of an engine comprising means for adding hydrocarbon emission readings as they are generated during operation of the engine through a plurality of modes including acceleration, deceleration and cruise.

3,630,073

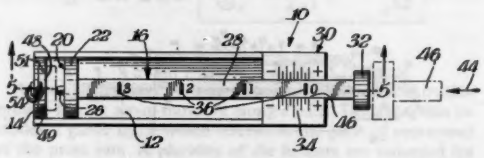
TABLET MEASURING AND TESTING DEVICE

Frank Michel, Brooklyn, N.Y., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 11, 1970, Ser. No. 18,601

Int. Cl. G01n *3/42*

U.S. Cl. 73—81 **10 Claims**



Tablets are measured and tested in a V-shaped channel by pushing a plunger against them in response to an external

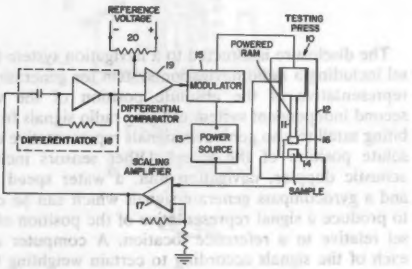
calibrated force. An elongated projection on the head of the projection works in conjunction with a slot in the anvil to snap scored tablets accordingly supported at three points. The thickness of one or a row of tablets is measured by scale markings on the stem of the plunger. Brittleness and shock resistance can also be determined by rapid actuation of the device.

3,630,074

RATE CONTROL FOR TOOLS

William Herbert Hartman, Fair Oaks, Calif., assignor to Research Derivatives Incorporated, Sacramento, Calif.

Filed Mar. 20, 1969, Ser. No. 808,732
Int. Cl. G01n *3/00*
U.S. Cl. 73—90 **10 Claims**



The first time derivative of the output voltage of a measuring transducer in a machine, which is a measure of the velocity of some parameter affected by the machine, such as the machine displacement, is compared with a fixed voltage standard. For a given velocity, the derivative output is fixed and if equal to the fixed reference, exactly balances out in the differential voltage comparator. If a velocity error is present, the comparator produces an error signal which is then amplified in a servocontrol arrangement, to force the machine to minimize the error signal and maintain a uniform rate of travel.

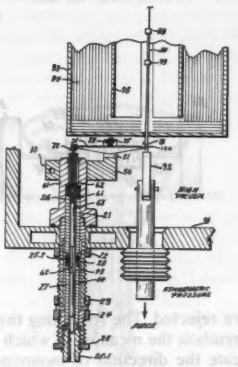
3,630,075

DOUBLE BEAM EXTENSOMETER

Fred K. Rose, Chula Vista, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Apr. 20, 1970, Ser. No. 29,968
Int. Cl. G01n *3/08*; **G01b** *5/00*
U.S. Cl. 73—95 **6 Claims**

A double beam extensometer, for use in a tensile- or creep-testing machine, particularly well suited for accurately and directly measuring the gauge length strain of thin material specimen, including composites and filaments as thin as 0.001 inch to a temperature of 5,000° F. in a high vacuum. The extensometer includes a brass lower body that contains two linear variable differential transformer windings, a copper upper body to which is affixed a closed end austenitic stainless-steel tube which extends downwardly through the linear variable differential transformer windings, a copper beam support bracket that clamps to the upper body, and cores, core suspensions, beams, extension strips, and associated conventional components, such as power supply, control panel with oscillator-demodulator and recorder readout. As the specimen is strained by the applied load, the beams are displaced and cause differential movement of the cores in the linear variable differential transformers and, therefore, difference in voltage as to each linear variable differential transformer. The difference in voltage is then read



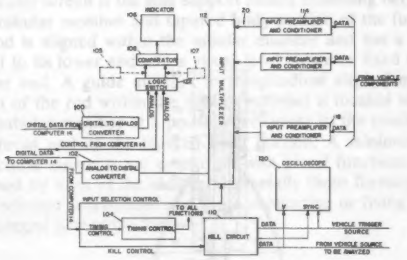
directly as the gauge length strain undergone by the specimen.

3,630,076

ENGINE ANALYZER

James E. Staudt, 206 Audubon Street, Hartselle, Ala.

Filed Dec. 31, 1969, Ser. No. 889,757
Int. Cl. G01m *15/00*
U.S. Cl. 73—117.3 **7 Claims**



A computerized analyzer for rapid diagnosis of an apparatus, which, by way of example may be an automotive vehicle. In such an application, the analyzer will read and/or compare the vehicle specifications to the related actual vehicle condition. The analyzer will also record either of these readings.

3,630,077

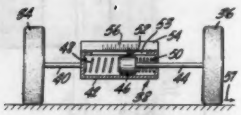
TIRE COVERS

Jacques Boileau, Clermont-Ferrand, France, assignor to Campagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, (Puy-de-Dome), France

Original application Feb. 2, 1968, Ser. No. 702,564, now Patent No. 3,578,054. Divided and this application July 13, 1970, Ser. No. 54,393
Int. Cl. G01m *17/02*
U.S. Cl. 73—146 **3 Claims**

A series of tires for an automotive vehicle is manufactured in accordance with an identical model, on identical machines and under identical conditions. Because of manufacturing tolerances, the tires have a pseudocamber the magnitude of

which is an aleatory variable. The pseudocamber is measured for each tire, and those tires having a pseudocamber producing a lateral thrust, when the tires roll at 10 km./h. at normal load and pressure on level ground, beyond 0 percent to 6 percent and, preferably, 1 percent to 4 percent of the rated



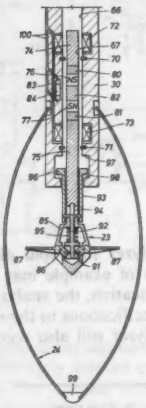
load of tire, are rejected. The remaining tires are marked by any arbitrary symbols the meaning of which is understood by users, to indicate the direction of mounting on a rim. The tires are mounted on their respective rims so that the lateral thrust is outward on the front wheels and inward on the rear wheels.

3,630,078

MAGNETIC SUSPENSION FLOWMETER

Jean-Loup Bonnet, Verrieres-le-Buisson, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,971
Claims priority, application France, Mar. 6, 1969, 6906277
Int. Cl. E21b *47/00*
U.S. Cl. 73—155 **11 Claims**



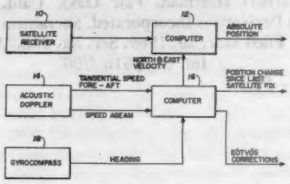
An illustrative embodiment of the present invention includes apparatus for making measurements of the rate of fluid flow in a producing well. The apparatus includes a body, a folding blade screw or spinner mounted on a shaft turning in the body and a blade-closing mechanism. The screw is mounted so that in operation its axis of rotation is suspended in a magnetic field which also provides an axial vibration to largely overcome the effects of static and dynamic friction on its motion.

3,630,079

NAVIGATION METHOD AND APPARATUS UTILIZING MULTIPLE SENSORS

John Mark Hughes, Dallas, and David Raynold Reinhartsen, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 27, 1969, Ser. No. 819,508
Int. Cl. G01c *23/00*
U.S. Cl. 73—178 **20 Claims**



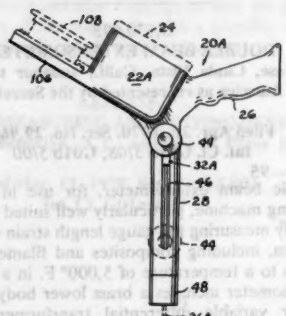
The disclosure is directed to a navigation system for a vessel including a radio navigation system for generating signals representative of the absolute position of the vessel. A second independent system utilizing radio signals from an orbiting satellite also generates signals representative of the absolute position of the vessel. Other sensors including an acoustic doppler, navigation unit, a water speed indicator and a gyrocompass generate signals which can be combined to produce a signal representative of the position of the vessel relative to a reference location. A computer combines each of the signals according to certain weighting functions in order to generate a resultant output signal which to a minimum mean squared error sense provides extremely accurate and reliable position information for the vessel.

3,630,080

TEMPERATURE, PRESSURE AND FLOW RATE SENSING PROBE AND ASSOCIATED GAUGE PLUG

Julian S. Taylor, 8600 S. W. 8th, Oklahoma City, Okla.

Filed Nov. 13, 1969, Ser. No. 876,349
Int. Cl. G01p *5/16;* **G01k** *1/14;* **G01l** *19/14*
U.S. Cl. 73—212 **11 Claims**



A handle-equipped instrument-supporting housing is provided with an elongated centrally bored stem having a socket at its free end for receiving an end portion of a gauge plug. A fluid sensing probe is telescopically received by the housing stem for entering the gauge plug when extended. Probes are provided for sensing temperature, pressure and flow.

3,630,081

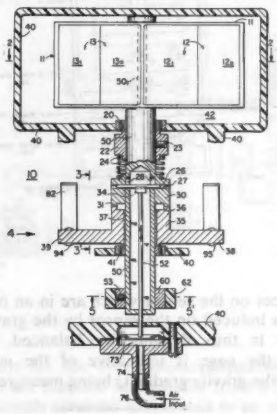
MILK METERING APPARATUS

Kurt Nelson, Wappingers Falls, N.Y., assignor to The De Lavel Separator Company, Poughkeepsie, N.Y.

Continuation-in-part of application Ser. No. 707,230, Feb. 21, 1968, now Patent No. 3,499,422. This application Jan. 6, 1970, Ser. No. 967

Int. Cl. G01f *3/28*

U.S. Cl. 73—219 23 Claims



Milking apparatus includes a reciprocating milk metering tilt table which is coupled by a shaft and clutch assembly to fluidic digital sensors. In accordance with selected aspects of the present invention, fluidic logic is employed to control the tilt table motion; to supply a quantitative indication of the milk yielded by an animal during a milking cycle; and to signal completion of milking.

3,630,082

ROTOR MEASURING DEVICE FOR FLUIDS

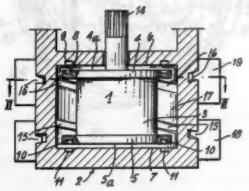
Roland Francois Edouard Frayssinoux, 64 Boulevard Soult, Paris, 12 eme, France

Filed June 1, 1970, Ser. No. 42,051

Claims priority, application France, May 30, 1969, 6917704

Int. Cl. G01f *1/00*

U.S. Cl. 73—231 R 8 Claims



A rotor measuring device comprising a rotor rotating without any mechanical bearing in an injection box having inlet and outlet ports the axis thereof are both tangent to a virtual helix formed on the inner walls of the box, in such manner that contiguous close fluid streams will follow an helicoidal course around said body and further that the axis of said body will be set at the center of a vortex tube and said body be driven rotatively at a speed in relation to the fluid outflow.

3,630,083

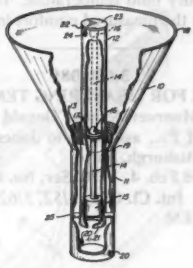
FILL-INDICATOR FUNNEL

Victor Gorans, 870 North Wheeler, St. Paul, Minn.

Filed Apr. 6, 1970, Ser. No. 25,895

Int. Cl. G01f *23/06*

U.S. Cl. 73—294 9 Claims



A funnel having a fill-indicator as an integral part thereof. The funnel has a tapered body portion with a spout projecting downwardly from the narrow or small end thereof. A tubular member is aligned within the spout and extends into the body portion. The lowermost termination of the tubular member is at a location within the lower half of the length of the spout but is preferably spaced in recess fashion from the lowermost end of the spout. The uppermost termination of the tubular member is at a location within the upper half of the body portion without extending beyond the wide mouth opening thereof. A filter screen is fixed transversely within the tapered body portion to the interior surface of that portion and to the exterior surface of the tubular member; and this filter screen is the sole support means extending between the tubular member and tapered body portion of the funnel. A rod is aligned within the tubular member and has a float fixed to its lower end and a visual level indicator fixed to its upper end. A guide member for longitudinal aligned movement of the rod within the tubular member is located within the tubular member at a position proximate to the small end or throat end of the tapered body portion. A minimum of structural elements are employed, with plural functions performed by most of the elements especially those forming the fill-indicator mechanism and those supporting or fixing it as an integral part of the funnel.

3,630,084

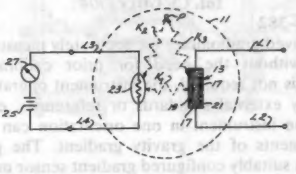
COMFORT INDEX INDICATOR

Lyle E. McBride, Jr., Norton, and Francis P. Buiting, Plainville, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 9, 1969, Ser. No. 856,256

Int. Cl. G01w *1/06*; G01n *25/64*; G01r *25/66*

U.S. Cl. 73—336 3 Claims



Apparatus for measuring and indicating the comfort index of an ambient atmospheric environment subject to variations

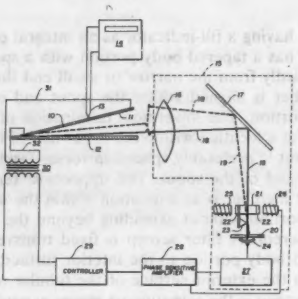
in dewpoint and dry bulb temperature. A heat source is provided which includes means for maintaining it at a temperature which varies as a substantially linear function of the dewpoint. Thermally coupled both to the heat source and the environment and thermally responsive thereto is means, e.g., a thermistor, for indicating a temperature which is the sum of linear functions of the heat source temperature and dry bulb temperature, this means being approximately 0.122 times as responsive to variations in the heat source temperature as to variations in the dry bulb temperature. The temperature indicated thereby is the measured comfort index.

3,630,085

APPARATUS FOR MEASURING TEMPERATURES

John E. Roney, Monroeville, and Donald M. Gerstner, Pittsburgh, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1970, Ser. No. 8,471
Int. Cl. G01j *5/52, 5/62*
U.S. Cl. 73—355 EM **2 Claims**



A body having a reflective surface whose temperature is adjustable is placed at an angle to a moving strand, such as steel strip, whose temperature is to be measured to form a wedge-shaped confined space which acts as a black body when the strand and body are at the same temperature. A radiant energy detector means alternately measures the radiant energy incident from a point on the reflective surface and from a point on the strand within the confined space and provides an electrical output which is a measure of the difference in the radiant energies incident from those points. This output is used to adjust the temperature of the body to the temperature of the strand whereby the strand temperature can be ascertained by direct measurement of the temperature of the body.

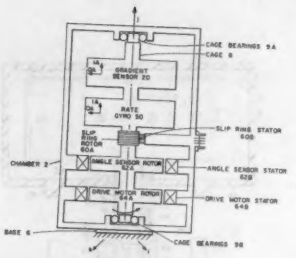
3,630,086

CENTRIFUGAL-BALANCE GRAVITY GRADIOMETER

Leonard S. Wilk, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 22, 1970, Ser. No. 48,416
Int. Cl. G01v *7/04*
U.S. Cl. 73—382 **6 Claims**

An improved gradiometer for accurately measuring gravity gradients without the need for prior calibration. Since calibration is not required, the instrument operates independent of any external standards or references, except time. Further, one instrument in one orientation can provide all the components of the gravity gradient. The gradiometer comprises a suitably configured gradient sensor mass within a case which, in turn, is mounted within a cage such that its input axis is aligned with the axis of rotation of the cage. The entire assemblage is contained within a chamber which is preferably mounted on a stabilized base. Forces are induced on the sensor due to gravity gradients, causing the mass to move relative to its case. This motion is sensed and used to rotate the cage relative to the chamber. The angular rotation of the cage, in turn, causes the sensing device (specifically, its case) to rotate about an axis perpendicular to the inertia



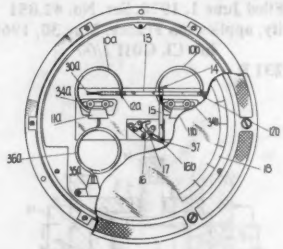
reaction forces on the sensor which are in an opposite sense to the forces induced on the sensor by the gravity gradients. The sensor is thus dynamically balanced. The angular velocity of the cage is indicative of the magnitude and direction of the gravity gradients being measured.

3,630,087

SUMMATION GAUGE

Colin William Ogden, Mansfield, and Alec Bailey, Arnold, both of England, assignors to Smith-Denis Limited, Nottingham, England

Filed Feb. 12, 1970, Ser. No. 10,935
Claims priority, application Great Britain, June 13, 1969, 30,004/69
Int. Cl. G01l *15/00*
U.S. Cl. 73—412 **8 Claims**



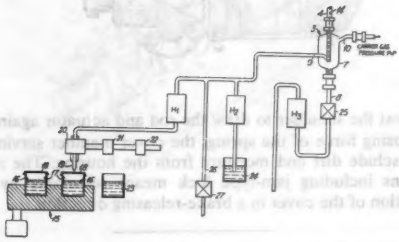
A summation gauge which gives the sum, and/or the mean, of two fluid pressures which are applied respectively to two Bourdon tubes. The moving ends of these tubes are connected to opposite ends of a balance beam which, at a central point in its length, is connected to a gauge quadrant. In an elaboration of this gauge, for giving the sum, and/or the mean, of four separate pressures, the Bourdon tubes and their beams are duplicated. The two beams are connected, each at a central point in its length, to the opposite ends respectively of a main balance beam which is connected, at a central point in its length, to the quadrant.

3,630,088

SAMPLE SUPPLY APPARATUS

Ronald Sawyer, Littlehampton, and Peter Bernard Stockwell, Biggin Hill, near Westerham, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 25, 1970, Ser. No. 13,969
Claims priority, application Great Britain, Feb. 27, 1969, 10,550/69
Int. Cl. G01n *1/14*
U.S. Cl. 73—423 R 3 Claims



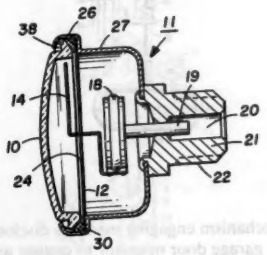
A feed system for use with analytical apparatus in which liquid samples are supplied sequentially from a magazine of samples to a sample reservoir and thence to an analytical apparatus, arrangements being made for flushing the sample reservoir prior to each sample being supplied to it. A gas chromatographic apparatus in association with the feed system.

3,630,089

PRESSURE VENTING INSTRUMENT CASING ASSEMBLY

Robert D. Bissell, Orange, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 9, 1970, Ser. No. 17,838
Int. Cl. G01l *19/14*
U.S. Cl. 73—431 11 Claims



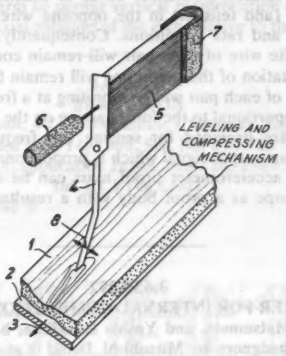
An instrument casing assembly for pressure gauges and the like providing controlled venting to atmosphere in event of overpressure buildup within the casing. Case engagement against the crystal exterior at selectively displaced peripheral locations compresses a resilient gasket to effect a watertight sealed enclosure. In the event of overpressure buildup from within, those crystal periphery portions intermediate locations held by the case flex outwardly to release the gasket seal thereat sufficiently to effect pressure venting.

3,630,090

PROCESS AND APPARATUS FOR DETERMINING THE DISTRIBUTION OF PARTICLE SIZES IN GROUND MATERIAL

Otto Heinemann, Ennigerloh, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Apr. 28, 1969, Ser. No. 819,802
Int. Cl. G01n *15/02*
U.S. Cl. 73—432 PS 3 Claims



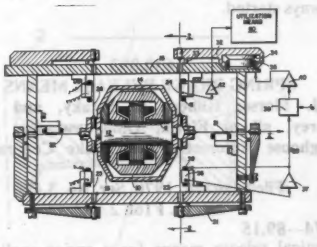
The particle size distribution in ground material is determined by bringing into contact with a layer of the ground material a mechanical sensing element which is deflectable with at least one degree of freedom, while a relative movement of predetermined constant velocity between the sensing element and the ground material takes place in a direction transverse to the direction in which the sensing element is deflectable. The resulting mechanical deflections of the sensing element are converted into electrical pulses, each of which is produced by contact of an individual particle of the material with the sensing element. In the resulting train of pulses, the number of pulses whose amplitude exceeds a threshold value which occur during a predetermined measuring interval of time are counted.

3,630,091

RATE AND/OR ACCELERATION SENSOR

William M. Scarborough, Whittier, and Doyle E. Wilcox, Hacienda Heights, both of Calif., assignors to North American Rockwell Corporation

Filed June 1, 1970, Ser. No. 42,359
Int. Cl. G01p *15/10*
U.S. Cl. 73—517 AV 10 Claims



The invention is directed to a proof body such as a gyroscope in which the spin axis is constrained to the housing or vehicle by five pairs of orthogonally disposed wire pairs.

The tension force each wire exerts on the gyroscope is sensed by determining the frequency of transverse vibration in each wire. The acceleration along three orthogonal axes and the rate of turn about two axes is obtained by processing the vibration-frequency data so as to solve the relationship: Tension = K(frequency)^2, for each wire. A tension control servo means is utilized for comparing the vibration frequency of the wire opposite a tension transducer with a precision reference frequency. The resulting error signal is used to activate the tension transducer so as to maintain a constant frequency (and tension) in the opposite wire under all acceleration and rate conditions. Consequently, the strain in the opposite wire of each pair will remain constant and the axes orientation of the gyroscope will remain fixed while the other wire of each pair will be vibrating at a frequency which will be proportional to the forces acting on the gyroscope.

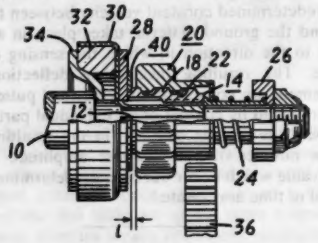
Means are provided for sensing this frequency and for providing an output signal which is proportional to the acting force. An accelerometer proof mass can be substituted for the gyroscope as a proof body with a resultant loss in rate sensing.

3,630,092

STARTER FOR INTERNAL-COMBUSTION ENGINE

Tsuyoshi Matsumoto, and Yoshio Kusajima, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1970, Ser. No. 4,832
Claims priority, application Japan, Jan. 23, 1969, 44/5915
Int. Cl. F02n *11/00*
U.S. Cl. 74—7 **7 Claims**



In Bendix-type starters, the stop disc has bent portions axially extending perpendicularly to its plane on the periphery of its concentric opening and is attached to the holder for the pinion by having the pinion's sleeve snugly fitted into the opening. The pinion and sleeve include the respective helical splines provided with lopped ends adapted to abut against the free edges of the bent portions on the disc. This prevents the pinion from striking against its holder ensuring that the engine is always started.

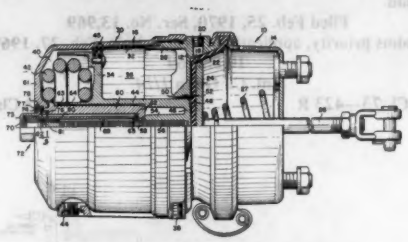
3,630,093

SPRING BRAKE RELEASE MEANS

Robert J. Morse; Gilbert A. Pataky, and Gilbert B. Pumphrey, all of Elyria, Ohio, assignors to Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

Filed Jan. 16, 1970, Ser. No. 3,470
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **6 Claims**

Mechanical release means for a spring-applied actuator comprising a threaded rod carried by the actuator and extending rearwardly into a fixed cylindrical socket of greater diameter than the rod and having a shoulder at the forward end of the socket, a rotatable hexagonal sleeve extending into the socket and engaging a hexagonal nut threaded onto the rod, the outer end of the sleeve being engaged by a cup-shaped, hexagonal cover member having an annular flange rotatably secured to the actuator housing, the cover member being rotatable so as to rotate the sleeve and drive the nut



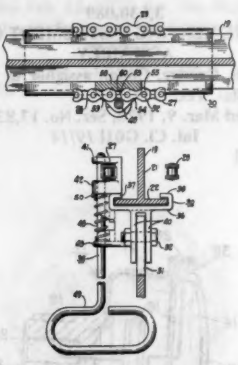
against the shoulder to draw the rod and actuator against the opposing force of the spring, the cover member serving also to exclude dirt and moisture from the housing. The release means including jam-type lock means releasable by mere rotation of the cover in a brake-releasing direction.

3,630,094

DRIVE MECHANISM ENGAGING MEANS

Alvin J. Carli, Sebring, Ohio, assignor to The Alliance Manufacturing Company, Inc.

Filed Dec. 22, 1969, Ser. No. 886,984
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.21 **13 Claims**

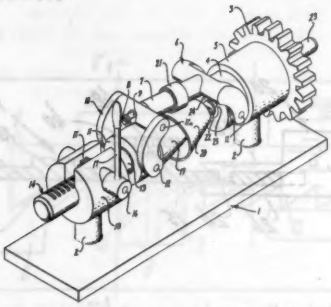


A drive mechanism engaging means is disclosed which may be used for a garage door operator to engage and disengage a chain as an example of a flexible drive member which is driven from a motor and speed-reducing drive train. The engaging means selectively engages and disengages a drive carriage from the chain so that in the event of electrical power failure, for example, the load carriage may be disengaged from the chain so that the garage door, which is fixed to the load carriage, may be manually operated to open and close the door. The engaging means may be actuated by a handle to be moved against a yieldable spring to stress the spring and thus release the load carriage from connection with the chain. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,630,095
VARIABLE-SPEED TRANSMISSION

David Stephen Eakin, 3656 Garnet St. Apt. 212, Torrance, Calif.

Filed May 1, 1970, Ser. No. 33,613
Int. Cl. F16h *15/16, 15/50*
U.S. Cl. 74—191 9 Claims

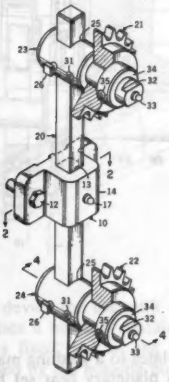


A variable-speed transmission employing a hollow outer cone disposed for hooplike spinning around an axially sliding inner cone. A driving roller is arranged for a restricted orbital rotation about the longitudinal axes of the cone and keeps the mating surfaces in constant contact. The two cones may have the same taper so that when the inner cone is completely inside the outer cone the driving roller merely freewheels around the surface of the outer cone and no motion is imparted to it. As the inner cone is withdrawn an increasing speed of rotation is imparted to the outer cone by the roller spinning it around on the varying diameter of the inner cone in the manner of a hoop. The outer member may also be cylindrical as well as conical.

3,630,096
DRIVE-TENSIONING APPARATUS

Carl T. Brewer, 1533 S. 7th Street, St. Louis, Mo.

Filed Aug. 21, 1970, Ser. No. 65,786
Int. Cl. F16h *7/12*
U.S. Cl. 74—242.1 A 12 Claims

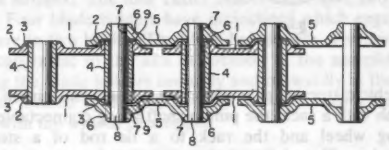


This drive-tensioning apparatus includes a base and a floating arm slidably mounted to the base. Rotatable idler elements are mounted at each end of the arm and each rotatable element is engageable with an outer face of the flexible drive element. The idler elements are spaced apart a distance less than the transverse distance between opposed taut and slack portions of a continuous drive element so that the slack portion of said element is tensioned by one or the other of said idler elements, depending on the direction of the drive and the floating arm is automatically relocated when the drive is reversed. The spacing between idler elements may be adjusted to suit specific drive systems. The arm is noncircular in section and the base includes a compatible aperture receiving the arm to permit vertical reciprocation of the arm but preclude axial rotation of the arm relative to the base.

3,630,097
BUSH CHAIN

Tatsuo Kuratomi, 4-2-18 Hamatake, Chigasaki, Japan

Filed Nov. 14, 1969, Ser. No. 876,725
Claims priority, application Japan, Mar. 24, 1969, 44/22200
Int. Cl. F16g *13/02*
U.S. Cl. 74—245 R 4 Claims

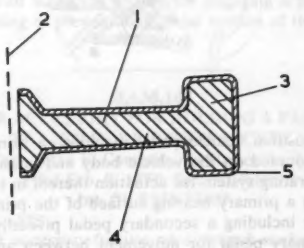


A bush chain comprising inner links having two bush portions and holes therein; and outer links having also two bush portions and holes therein, bush portions and holes of said cylindrical pin bearings in said inner and outer links, said bearings having surfaces longer than the thickness of said links, a sleeve fixed in said holes of said inner links in alignment with said outer links; a pin fixed in the holes of said outer links at both ends to said bush portions of said outer links; the bearing surfaces of the holes of the bush portions of the inner links and of the holes of the bush portions of the outer links being longer than the thickness of said inner and outer links.

3,630,098
THERMOPLASTIC GEAR WHEELS

David F. Oxley, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 27, 1970, Ser. No. 15,116
Claims priority, application Great Britain, Mar. 26, 1969, 15,752/69
Int. Cl. F16h *55/12, 57/04*
U.S. Cl. 74—439 10 Claims



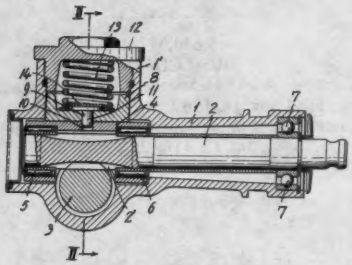
A laminar gear wheel consisting of a core of a polyamide and surface skins of a polyamide containing a lubricant.

3,630,099

RACK AND PINION STEERING GEAR APPARATUS FOR A VEHICLE

Takeomi Miyoshi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1970, Ser. No. 29,019
Claims priority, application Japan, Apr. 19, 1969, 44/35507
Int. Cl. B62d *1/20*; F16h *1/04*
U.S. Cl. 74—498 6 Claims



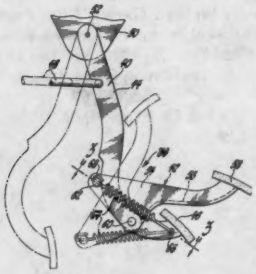
A vehicle steering gear apparatus comprises a pinion shaft in mesh with a rack, the pinion shaft being connectable to a steering wheel and the rack to a tie rod of a steering mechanism. The pinion shaft is supported at one end by a bearing that permits pivotal movement of the pinion shaft thereabout, and at its other end the pinion shaft is supported by a pair of bearings in a tube for axial, slidable movement. A spring acts on the tube between the pair of bearings to urge the pinion into pressure contact with the rack.

3,630,100

VEHICLE PEDAL

Henry Lemak, Huntington Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 10, 1970, Ser. No. 53,860
Int. Cl. G05g *1/16*
U.S. Cl. 74—562 3 Claims



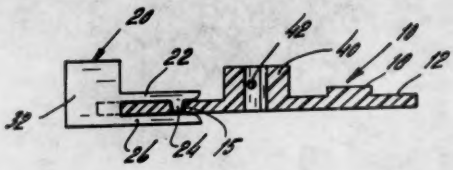
A dual-position vehicle pedal including a primary pedal pivotally mounted on the vehicle body and connected to a vehicle-operating system for actuation thereof in response to pressure on a primary bearing surface of the primary pedal and further including a secondary pedal pivotally mounted on the primary pedal for movement between an extended position wherein a secondary bearing surface thereon overlies the primary bearing surface to thereby extend the reach of the primary pedal and a normal retracted position exposing the primary bearing surface.

3,630,101

ROTARY TIMING DISC

Dalbro R. Nixon, Jr., Chesapeake; David J. McIlhenny, Suffolk, and Marvin L. Harrell, Portsmouth, all of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Filed Jan. 20, 1971, Ser. No. 108,018
Int. Cl. F16h *54/04*
U.S. Cl. 74—568 T 11 Claims



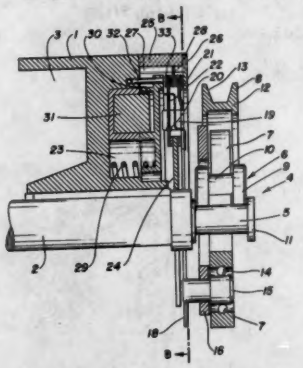
Rotary timing discs used in aerosol dispensers, particularly discs having adjustable time increment lugs mounted in their periphery, so as to contact a limit switch, or the like. As the disc rotates, the lugs contact the limit switch, activating an electrical circuit, which dispenses the aerosol bomb at the preselected time interval.

3,630,102

WASHING MACHINE DRIVE

Preben Knud Larsen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Mar. 18, 1970, Ser. No. 20,506
Claims priority, application Germany, Apr. 2, 1969, P 19 16 961.0
Int. Cl. F16h *3/44*
U.S. Cl. 74—789 4 Claims



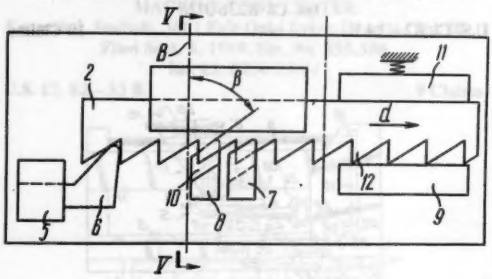
The invention relates to a washing machine drive comprising a motor and a planetary gear set having friction wheel gears. Clutch means are provided whereby two speeds, which are a spinning speed and a washing speed, are obtained by locking the planetary gear carrier to the sun gear or the casing. The clutch is operative in axial directions but is constructed so as to prevent axially directed forces from being transmitted to the friction wheels of the planetary gear set.

3,630,103

METHOD AND A DEVICE FOR SETTING TEETH OF BAND AND DISK SAWS

Vladimire Viktorovich Idel, Gorkovsko, oblasti, ulitsa Graftio, 15, kv. 6, Zavolzhie, U.S.S.R.

Filed Feb. 11, 1970, Ser. No. 10,392
Claims priority, application U.S.S.R., Feb. 19, 1969, 1304934
Mar. 4, 1969, 1308951
Int. Cl. B23d 63/00
U.S. Cl. 76—112 7 Claims



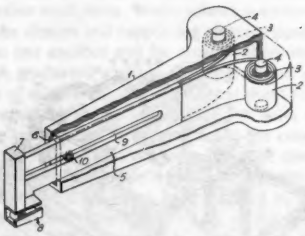
There is proposed a method for setting teeth of band and disk saws, whose essence resides in that impacts are imparted to one edge of each tooth in the direction of its bending away, and a device for effecting this method, wherein striking members having their working surfaces inclined to the side surface of the saw are arranged in such a manner that said working surfaces are inclined also to the plane of cross section of the saw, said plane lying perpendicular to the straight line connecting two apices of the neighboring working teeth of the saw.

3,630,104

MEASURING DEVICES

Richard Morton Milner, Watford, England, assignor to National Research Development Corporation, London, England

Filed Jan. 27, 1970, Ser. No. 6,068
Claims priority, application Great Britain, Jan. 28, 1969, 4,650/69
Int. Cl. G01l 5/04
U.S. Cl. 81—3 J 1 Claim



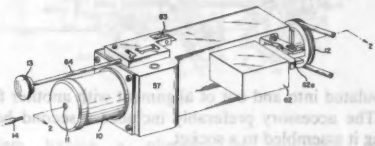
A tension control device for use with a measuring tape, which device comprises a housing containing spring means connected between a fixed part of the housing and tape clamping means carried by the housing but movable relative thereto, the spring means being adapted to exert a substantially constant tension when extended by relative movement of the tape clamping means, the tape clamping means being adapted for releasable securement to a tape at any point along its length, and the housing being formed to provide a handle.

3,630,105

WIRE-STRIPPING MACHINE

George William Rider, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 15, 1970, Ser. No. 37,717
Int. Cl. H02g 1/12
U.S. Cl. 81—9.51 9 Claims



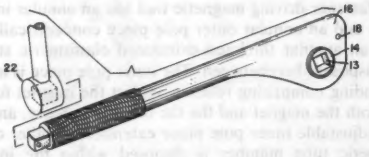
A wire-stripping machine has an improved iris-type blade assembly which is continuously rotating. A wire to be stripped is inserted in the iris which is then closed to cut the insulation. When the wire is withdrawn the end of the insulation is stripped. The four cutter blades each have two apertures. Four blade holders have projections which engage an aperture in two blades. The blade holders are driven in slots in a cap radial to the axis of rotation of the assembly. By driving the blade holders inwardly and outwardly in the slots the iris formed by the blades is closed into cutting engagement with the wire to be stripped.

3,630,106

SOCKET WRENCH

Oliver D. Olinger, 5130 Roeder Road, San Jose, Calif.

Filed Nov. 19, 1969, Ser. No. 878,092
Int. Cl. B25b 17/00
U.S. Cl. 81—57.29 1 Claim



A wrench having a rotatable work engaging member provided with gear teeth meshing with a worm that is attached to a shaft, said shaft having a handle at one end thereof. The gear and worm are housed in a housing that is formed of sheet metal by bending the sheet metal around the shaft and closing the open sides of the sheet metal by welding, brazing or the like. The shaft is provided with a bearing surface engaging one end of the housing. The other end of the shaft is provided with a bearing groove for engaging a pin attached to the housing to prevent lengthwise motion of the shaft and worm.

3,630,107

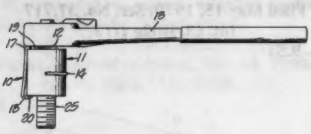
KEEPER ACCESSORY FOR HOLDING A FASTENER SEATED IN A WRENCH SOCKET

Harry A. Carr, 2934 El Caminito, La Crescenta, Calif.

Filed Feb. 9, 1970, Ser. No. 9,809
Int. Cl. B25b 13/02
U.S. Cl. 81—125 8 Claims

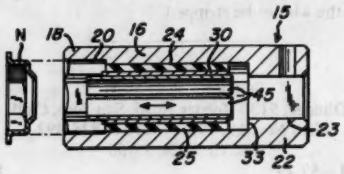
A keeper accessory for use on a wrench socket to hold a fastener frictionally and rigidly captive within the socket. The accessory is designed for attachment to a twelve point socket without need for alteration in the socket. The one-piece accessory includes a hook embracing the rim edge of the

fastener end and positioned to press resiliently against one face of the fastener to hold the latter captive while being



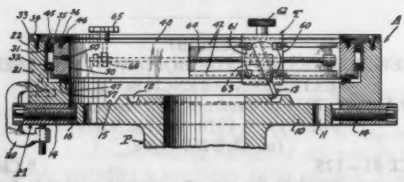
manipulated into and out of alignment with another fastener part. The accessory preferably includes a second hook for locking it assembled to a socket.

3,630,108
MAGNETIC TOOL
George B. Stillwagon, Jr., Dayton, Ohio, assignor to Gardner-Denver Company, Dayton, Ohio
Original application Feb. 5, 1968, Ser. No. 703,021, now Patent No. 3,538,792. Divided and this application May 11, 1970, Ser. No. 36,289
Int. Cl. B25b *13/02, 15/00*
U.S. Cl. 81—125 **8 Claims**



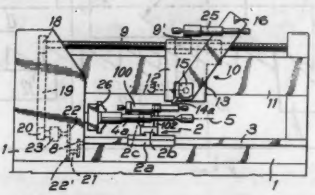
A fastener-driving magnetic tool has an annular inner pole piece and an annular outer pole piece concentrically spaced with an annular thickness-orientated elastomeric strip magnet disposed therebetween. The inner pole piece is in radially expanding comprising relation against the magnet for retaining both the magnet and the the inner pole piece, and an axially adjustable inner pole piece extension member or a non-magnetic tube member is disposed within the inner pole piece.

3,630,109
PORTABLE FACING AND GROOVING MACHINE
Harry T. MacMichael, Secane, and William A. McNamara, Ridley Park, both of Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.
Filed Feb. 16, 1970, Ser. No. 11,648
Int. Cl. B23b *5/16*
U.S. Cl. 82—4 C **10 Claims**



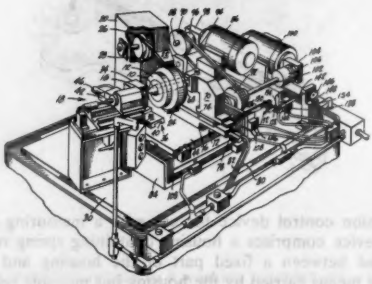
An annular tool or device for facing or grooving flanges adapted to fixedly mount thereon comprising an inner rotatable housing means with ring gear attached thereto and a tool arm rigidly attached at two points carrying a toolholder means for holding a metal-cutting tool and means for rotating the inner rotatable housing within an annular fixed housing so as to cause the tool to face or groove the flange.

3,630,110
COPYING LATHE
Jules Louis Jeanneret, 13-21 Rue Henri Gelin, Niort, France
Filed June 17, 1968, Ser. No. 737,418
Claims priority, application France, June 20, 1967, 111097
Int. Cl. B23b *3/28*
U.S. Cl. 82—14 R **10 Claims**



A copying lathe having at least one combined copying assembly for machining a workpiece in accordance with an established contour, comprising a transversally movable slide mounted on a slide bar which is swivably mounted on a longitudinally displaceable carriage, the longitudinal position of the carriage being controlled by a first feeler which cooperates with a first said established contour which is to be copied and which contour is fixed to the bed of the lathe to thereby move said carriage, said slide also cooperating with a second said established contour mounted adjacent a second feeler mounted on the carriage, said slide being moved transversally to the axis of the workpiece by means which are independent of the means which moves the carriage.

3,630,111
MACHINING ASSEMBLY
Lloyd Hartford; Herbert Waxman, both of Northridge, and William I. Caldwell, Canoga Park, all of Calif., assignors to CCI Aerospace Corporation, Van Nuys, Calif.
Filed Oct. 21, 1968, Ser. No. 769,199
Int. Cl. B23b *5/36, 19/02*
U.S. Cl. 82—15 **14 Claims**



A method and apparatus for producing a shell body of revolution with a substantially constant wall thickness comprising: Preparing the shell by accurately machining a surface concentric and perpendicular to the axis of the shell surface,

the machined surface facilitating accurate alignment of the shell within the machining apparatus, cutting both the inside and outside surfaces of the shell simultaneously with the cutters at a fixed separation to maintain constant wall thickness; controlling the rotational velocity of the shell during machining with respect to the transverse movement of the cutters to maintain constant surface cutting speed by means of a pivotal eccentric cam operating upon at least one potentiometer.

3,630,112

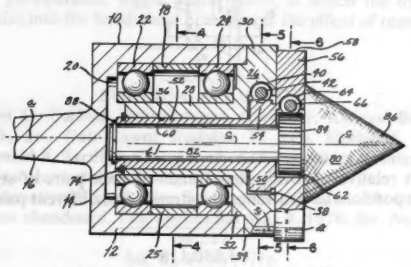
MACHINE TOOL CENTER

Kenneth J. Sudholt, 3801 Fair Oaks Drive, Granite City, Ill.

Filed Sept. 4, 1969, Ser. No. 855,306

Int. Cl. B23b *23/04*

U.S. Cl. 82—33 R **9 Claims**



A machine tool center includes a housing in which an outer sleeve is journaled by means of bearings. The outer sleeve is provided with an eccentric bore which receives an inner sleeve also having an eccentric bore, the eccentricities of the bores relative to outer surfaces of their respective sleeves being equal to that the sleeves may be turned such that the eccentricities offset each other and thus position the axial centerline of the inner sleeve bore coincident to the axis of rotation for the bearing. The inner sleeve bore receives a workpiece supporting element having a knurled conical point adapted to fit nonrotatively within the center hole at the end of a shaft or other workpiece. Worm screws are provided for both locking the sleeves and supporting element against rotation relative to one another and for rotating them relative to one another. A graduated scale on the inner sleeve indicates the magnitude of eccentricity for the conical point relative to the axis of rotation for the bearings. Once the outer sleeve is adjusted to the eccentricity corresponding to the eccentricity of the hole in the end of the workpiece, the high spot on the workpiece is brought around to a position opposite the eccentricity by rotating the conical point relative to the inner sleeve. In that position the outer surface of the workpiece will run true when the workpiece is turned from its other end.

3,630,113

APPARATUS FOR CUTTING HELICALLY WOUND TUBES

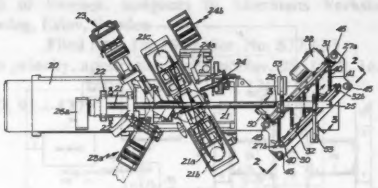
Ernest Winston Ronai, 56 Linden Ways, Sydney, New South Wales, Australia

Filed Feb. 5, 1970, Ser. No. 8,965

Int. Cl. B23b *37/00*

U.S. Cl. 82—53.1 **10 Claims**

This invention relates generally to tube cutoff equipment, and particularly to a continuously operating cutoff



mechanism having a plurality of uniformly spaced straightedge cutting knives mounted thereon.

3,630,114

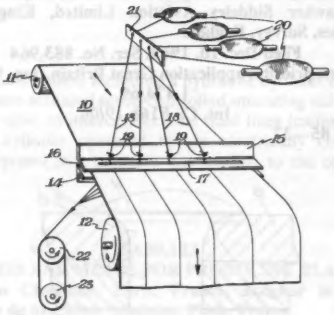
POLYMERIC FILAMENT SHEET SLITTING

William W. Bunting, Jr., Wilmington, Del., and Robert E. Buskirk, Pennsville, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 15, 1970, Ser. No. 28,775

Int. Cl. B26d *5/00*

U.S. Cl. 83—23 **10 Claims**



Process and apparatus for the slitting of polymeric, poromeric, elastomeric and regenerated cellulose films, nonwoven webs embodying polymeric threads, filaments or staple fibers, and the like, and the slit product thereof, wherein the sheet material is advanced against a polymeric filament cutting means drawn therethrough.

3,630,115

AUTOMATIC COMPENSATION FEED, SPEED-CONTROLLED COPIER

Arnold G. Ulmer, Endicott, N.Y., assignor to GAF Corporation, New York, N.Y.

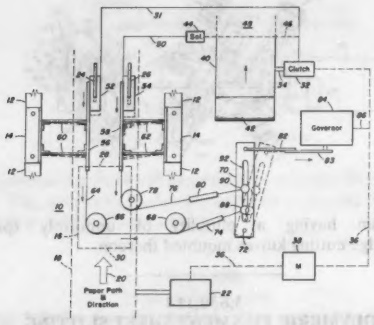
Filed May 22, 1970, Ser. No. 39,625

Int. Cl. B26d *5/20*

U.S. Cl. 83—72 **6 Claims**

The response times of the magnetic clutch drive and the cutting knife solenoid of an automatic roll feed diazocopying machine which tend to adversely affect each length of cut copy paper with respect to the corresponding original with changes in paper feed speed, are continuously taken into account or corrected by an automatic paper feed speed responsive control mechanism over the entire speed range of the common copying drive system of the machine. The control mechanism selectively and differentially advances the original front edge sensor switch, and the rear edge sensor switch, as the speed of the originals increases, for example;

so that any tendency for the cut copy paper lengths to vary with respect to the lengths of the corresponding originals due

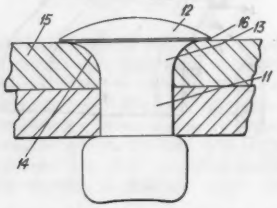


to the paper feed speed increase, is effectively automatically corrected by a governor that is continuously responsive to such speed.

3,630,116
RIVET

Robert Henry Travell Harper, Knebworth, England, assignor to Hawker Siddeley Aviation Limited, Kingston-upon-Thames, Surrey, England

Filed Dec. 10, 1969, Ser. No. 883,964
Claims priority, application Great Britain, Jan. 9, 1969, 1,474/69
Int. Cl. F16b *19/06*
U.S. Cl. 85—37 **3 Claims**



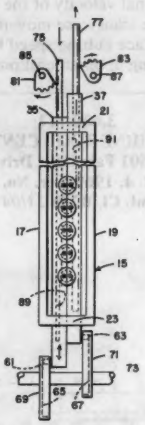
A rivet is provided of which the head is convex but of a height considerably reduced in comparison with that of a conventional hemispherical head, and the necessary thickness of head metal is obtained in the regions of the head periphery by flaring out the rivet shank in a smooth curve to meet the convex head at the head periphery, at which periphery there is a very short cylindrical surface instead of a sharp edge. At a distance one-third of the way out from the normal shank diameter to the maximum head diameter the full depth of the head, including the portion due to the flare out of the shank, is approximately equal to the depth of a conventional countersunk rivet head at the same diameter.

3,630,117
METHOD AND APPARATUS FOR MAKING NETLIKE STRUCTURES FROM PREFORMED STRANDS

Warren H. Guy, Glen Mills, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 16, 1969, Ser. No. 825,211
Int. Cl. D04g *1/00*
U.S. Cl. 87—12 **10 Claims**

Method and apparatus for making netlike structures from preformed strands by repeatedly revolving strands of each pair of a plurality of pairs of preformed strands alternately

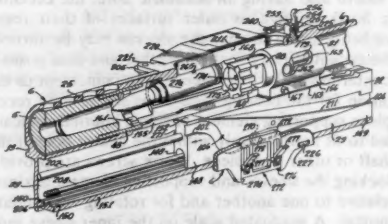


with relatively moving the strands of such pairs of strands into positions as to arrange the strands into different pairs.

3,630,118
TWO-STEP AMMUNITION FEEDER

Eugene M. Stoner, 2292 No. Carriage Lane, Port Clinton, Ohio

Filed Sept. 5, 1969, Ser. No. 855,492
Int. Cl. F41d *9/02*
U.S. Cl. 89—33 C **9 Claims**



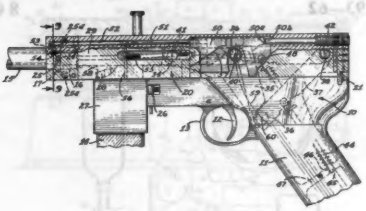
An automatic gun is provided with a reciprocating bolt carrier having cam surfaces extending along its exterior for reciprocating a follower which operates an ammunition feed mechanism. A lower cam surface is formed directly on the bolt carrier and an upper cam surface is formed on the upper surface of an elongated ramp pivotally mounted on the bolt carrier. The ramp is movable between two positions to cause the follower to follow the lower cam surface when the bolt carrier moves forwardly and to follow the upper cam surface when the carrier reverses. The slope of the cam surfaces is such that the follower moves through its total downward return stroke when engaging the forward portion of the lower cam surface and then is gradually advanced upwardly during the remainder of its contact with the lower cam surface and throughout its entire contact with the upper cam surface.

3,630,119

GAS-OPERATED TOGGLE ACTION WEAPON

Walter E. Perrine, 1822 North 24th Street, Phoenix, Ariz.

Filed Dec. 4, 1969, Ser. No. 882,009
Int. Cl. F41d 5/04
U.S. Cl. 89—189 7 Claims



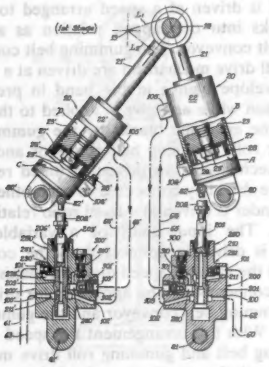
A gas-operated, toggle action pistol, in which the toggle recedes into the handle and counteracts the effect of recoil.

3,630,120

SWINGING APPARATUS

Ernest C. Carlson, Schwetzingen, Germany; Andrew Brudnak, Jr., Oak Lawn; Rudolph E. Yeh, Elmhurst, and Ronald F. Sardiga, Chicago, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation of application Ser. No. 794,637, Jan. 28, 1969, now abandoned. This application May 4, 1970, Ser. No. 34,227
Int. Cl. F15b 11/16
U.S. Cl. 91—411 R 26 Claims



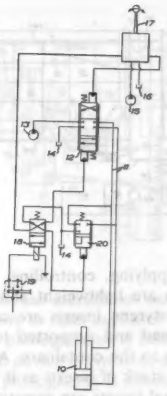
An apparatus for converting rectilinear motion to rotational motion about a first axis having two pivotal members fixed about and rotatable with respect to each other and to the first axis, two hydraulic motors interconnected between said pivotal members, a source of fluid power supply connected to each hydraulic motor by conduit means, directional flow control means for selectively delivering fluid power to the hydraulic motors, sequence valve means for sensing the position of the hydraulic motors and for directing flow to aid in obtaining a relatively constant torque output and angular velocity, bleeder valve means for reducing hydraulic input energy when the pivotal member is near the end of its rotation and for maintaining a maximum velocity potential throughout the rotational movement, and relief valve means for additionally controlling torque output.

3,630,121

EXCAVATING MACHINES

Kjell Anton Landaeus, Lund, and Karl Oscar Olsson, Eslov, both of Sweden, assignors to Akermans Verkstad Aktiebolag, Eslov, Sweden

Filed Nov. 18, 1969, Ser. No. 877,633
Claims priority, application Sweden, Nov. 29, 1968, 16290/68
Int. Cl. F15b 11/08, 13/043
U.S. Cl. 91—437 4 Claims



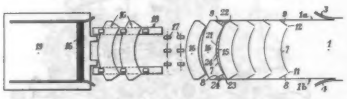
A hydraulic system including a hydraulic cylinder operated by a pressure-actuated servo-controlled operating valve and a crossover valve to interconnect the fluid lines leading to the hydraulic cylinder operated by an electrically controlled valve interposed in a pressure line leading to the operating valve.

3,630,122

METHOD AND MEANS FOR PRODUCING BLANKS

Louis Jean Chambon, Paris, France, assignor to Societe d'Etudes de Machines Speciales, Paris, France

Filed Mar. 24, 1970, Ser. No. 22,340
Claims priority, application France, Mar. 28, 1969, 69 09455
Int. Cl. B26d 1/56
U.S. Cl. 93—36 M 5 Claims

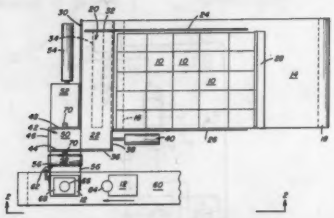


This apparatus for cutting blanks intended for the manufacture of frustoconical containers is characterized in that it comprises a first pair of rotary cutting rollers provided with knife blades adapted to form in said strip a first transverse central arcuate cut line corresponding to the minor base of the developed frustoconical surface of said containers, together with a pair of small lateral radial cut lines intersecting the edges of the strip but leaving two small uncut portions in the strip between said small radial cut lines and said first central arcuate cut line, and another pair of rotary cutting rollers provided with a knife blade adapted to form in said strip another transverse central arcuate cut line corresponding to the major base of said developed frustoconical surface, said other arcuate cut line extending from one edge to the other edge of the strip and through said previously uncut portions, in order to sever a complete blank from the strip.

3,630,123
CONTAINER INSERT APPARATUS

Edward E. Ames, Hilton; Charles L. Cooke, and Kenneth N. Ross, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 14, 1969, Ser. No. 841,275
Int. Cl. B31b *11/74, 1/62, 1/06*
U.S. Cl. 93—37 R 14 Claims

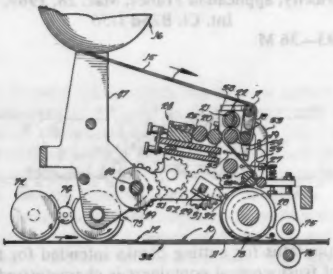


Apparatus for supplying, controlling, and inserting container inserts which are lightweight and relatively unstable when stacked. Polystyrene inserts are supplied in multiple stacks and are aligned and supported to prevent misalignment during feeding to the containers. A movable wall supports and aligns the stack of inserts as it is moved to a feeding hopper. Individual inserts are removed from the bottom of the stack in the feeding hopper and are passed over an adhesive applicator. The individual insert is then pressed into a waiting container.

3,630,124
CONVERSION ATTACHMENT FOR A CONVENTIONAL NONWINDOW ENVELOPE MACHINE

Ernst C. Sauerman, Chicago, Ill., assignor to Gaw-O'Hara Envelope Co., Chicago, Ill.

Filed Jan. 30, 1970, Ser. No. 7,521
Int. Cl. B31b *1/62, 1/82, 39/74*
U.S. Cl. 93—61 A 1 Claim

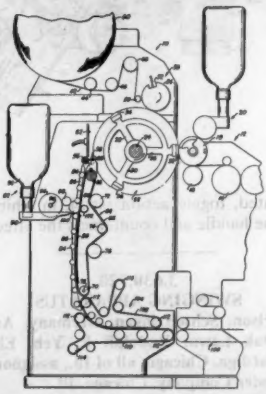


An attachment for converting a conventional nonwindow envelope machine into one in which a web of patching material is partially severed for providing either a window transparency or a liner for an envelope forming individual patches, said patches being gummed for attachment to the interior of an envelope blank and the partially severed web fed to the circumference or filler plate of a rotating vacuum cylinder where the individual gummed patches are completely severed and each carried into contact with and affixed to an envelope blank, the cylinder having multiple scoring blades for providing the envelope blanks with score lines for subsequent folding of its flaps to complete the envelope.

3,630,125
APPARATUS FOR REGULATING THE SEAL GUM WIDTH ON ENVELOPE AND BAG MACHINERY

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed May 14, 1970, Ser. No. 37,203
Int. Cl. B31b *21/74, 1/62, 1/96*
U.S. Cl. 93—62 8 Claims



Apparatus for applying gum or adhesive to the seal flap of an envelope includes a collator vacuum cylinder that feeds the envelope blanks at a predetermined speed relative to the drive shaft of the envelope machine to a collator roll. The collator roll is driven at a speed arranged to move the envelope blanks into overlapped relation as a band onto a gumming belt conveyor. The gumming belt conveyor and the gumming roll drive mechanism are driven at a speed to maintain the envelope blanks in the band in preselected overlapped relation while adhesive is applied to the exposed flap portion of the envelope blanks by the gumming apparatus. The collator roll, gumming belt conveyor and the gumming roll drive mechanisms are driven in timed relation to each other and are drivingly connected to each other. The collator vacuum cylinder is driven at a fixed ratio relative to the main drive shaft. The input shaft of a variable speed drive mechanism is drivingly connected to the collator vacuum cylinder and the variable speed drive mechanism output shaft is drivingly connected to the apparatus for driving the collator rolls, gumming belt conveyor and the gumming roll drive mechanism. With this arrangement the speed of the collator roll, gumming belt and gumming roll drive mechanism may be changed relative to the speed of the collator vacuum cylinder and thus vary the overlapped relationship of the envelope blanks and the width of the strip of seal gum applied to the seal flap portion of the envelope blank.

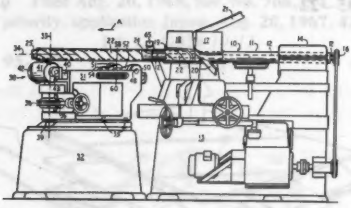
3,630,126
APPARATUS FOR CUTTING TUBES

Ernest Winston Ronai, 56 Linden Way, Castlecrog, New South Wales 2068, Australia

Filed Aug. 18, 1969, Ser. No. 850,767
Int. Cl. B31c *3/00, 11/00;* B23b *5/14*
U.S. Cl. 93—80 15 Claims

Method and apparatus for cutting continuous tubing which has been helically wound from a strip or strips of sheet material into tubular sections of uniform length by means of a rotary helical cutter which is periodically applied to the tubing, the point of cutter contact moving longitudinally along the cutting mandrel at the same speed as the tubing and the helical cutter blade being maintained at the point of

contact at an angle perpendicular to the axis of the tubing being cut, to produce a cut around the complete circumference of the tubing at right angles to the tubing axis and form tube unit of a predetermined length.



3,630,127

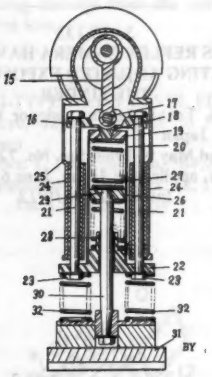
TAMPING MACHINE

Masahiro Yamato, Kawaguchi, Saitama, Japan, assignor to Hiroshi Matsumoto, Tajima Urawa Saitama, Japan

Filed May 21, 1969, Ser. No. 826,616

Int. Cl. E01c *19/30*

U.S. Cl. 94—49 **2 Claims**



A tamping machine comprises a crank drive for operating a connecting rod, a pair of piston rods driven by the connecting rod and slidably received by the machine housing, a movable cylinder loosely mounted inside the machine housing, socket joint means for engaging the top end of the movable cylinder with the connecting rod, the forward or lower end of the piston rods being removably engaged with the lower end of the movable cylinder, and a percussion piston biased against the two ends of the cylinder and having a ramrod which has at the lower end thereof the tamping foot. The cylinder can be disassembled from the machine housing by disengaging it from the piston rods at the lower end of the former. The machine has further cushion springs for absorbing shock blows and a rod for supporting the machine and preventing turning of the tamping foot.

3,630,128

AUTOMATIC CHANGEOVER DEVICE TO FLASHLIGHT PHOTOGRAPHY FOR CAMERA OR SHUTTER

Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

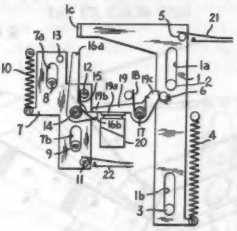
Filed Aug. 21, 1969, Ser. No. 851,957

Claims priority, application Japan, Aug. 28, 1968, 43/61205

Aug. 23, 1968, 43/59849

Int. Cl. G03b *7/00*

U.S. Cl. 95—10 C **11 Claims**



Camera shutter release mechanism automatically changes from daylight exposure to flash exposure when the brightness of the subject to be photographed is below a selected value. However, if the flash device is not in operative condition, no changeover to flash photography is effected regardless of the light value. A pilot lamp indicates the inoperative condition of the flash device.

3,630,129

CAMERA MECHANISM FOR ACTUATING MECHANICALLY FIREABLE FLASH UNITS

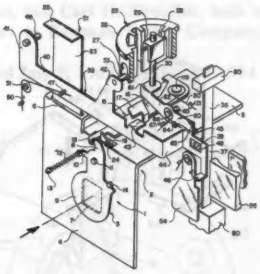
Alex T. Gow, Dunstable, England, and Helmut Ettischer, Ruit, Wurttenberg, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 20, 1970, Ser. No. 91,409

Claims priority, application Germany, Nov. 22, 1969, P 19 58 699.3

Int. Cl. F21k *5/02*; **G03b** *15/04*

U.S. Cl. 95—11.5 R **2 Claims**

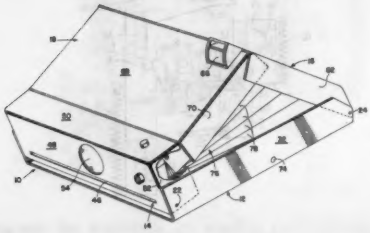


A camera mechanism is provided with a single multipurpose member adapted to (1) disable flash mode assemblies during daylight operation; (2) position an actuator bar in ready-for-firing engagement with a mounted, mechanically actuable flash unit; (3) act in coupling the shutter driver and an actuator member to actuate the flash unit in synchronism with shutter operation; (4) control the signaling of an inoperative flashlamp indicator; and (5) retract the actuator member to facilitate reorientation of multilamp flash units.

3,630,130
FOLDING CAMERA

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of application Ser. No. 663,719, Aug. 28, 1967, now abandoned. This application Mar. 21, 1969, Ser. No. 809,143
Int. Cl. G03b *19/10*
U.S. Cl. 95—11 29 Claims

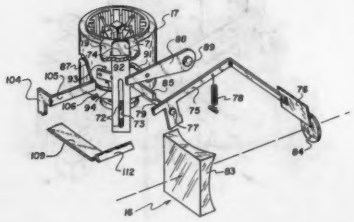


A camera is disclosed comprising a housing including four sections joined for pivotal movement about parallel axes between operative and folded positions, a lens and shutter enclosed in one housing section, a mirror in a second housing section, a focal plane plate for locating a recording medium for exposure in a third housing section and an opaque elastic envelope coupled between the three housing sections providing a lighttight chamber through which light is transmitted from the lens via the mirror to the recording medium.

3,630,131
FLASHBULB INDEXING MECHANISM

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 2, 1969, Ser. No. 854,567
Int. Cl. G03b *15/035*
U.S. Cl. 95—11 9 Claims

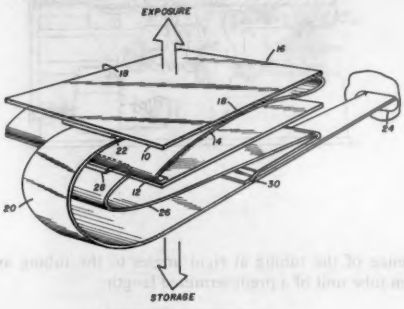


A camera adapted to use a so-called flashcube or other multiple flashbulb unit is provided with an indexing mechanism which operates automatically prior to each film exposure to index the flashbulb unit until the mechanism detects the arrival of an unfired lamp at a predetermined firing position. If no unfired lamp is available, an appropriate signal is provided automatically to alert the camera operator to that fact.

3,630,132
PHOTOGRAPHIC FILM PACK

Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 3, 1970, Ser. No. 43,069
Int. Cl. G03b *17/50*
U.S. Cl. 95—22 9 Claims

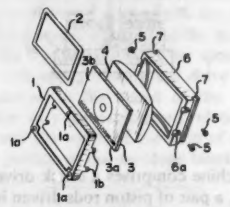


A pack embodying conventional photographic film, in the form of a strip thereof, has such strip so folded and joined that the various exposure sections of the film strip may be successively uncovered in the exposure aperture of the pack, by means of respective pull tabs. The exposed film sections are successively drawn into a storage section within the pack by means of the pull tabs; and such film is stored in the pack in strip form to facilitate subsequent handling thereof. The pack may be employed in cameras of the instant processing-type.

3,630,133
SINGLE-LENS REFLEX CAMERA HAVING A DEVICE FOR INDICATING ADJUSTED EXPOSURE VALUE IN THE FINDER

Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed May 9, 1968, Ser. No. 727,865
Claims priority, application Japan, June 6, 1967, 42/48022
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 9 Claims



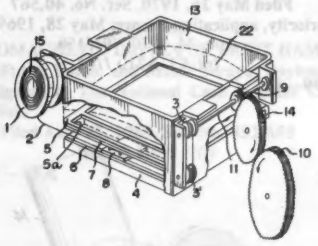
A single-lens reflex camera is provided with at least two interchangeable viewfinders wherein exposure factors, such as shutter speed, aperture opening and the like, may be observed along the edges of the viewing screen. With one viewfinder positioned on the mirror box of the camera, an inverse image of the object is observed, and with the other viewfinder in place, an erected image of the object is observed. A viewing screen is provided with exposure indicia so arranged that an erected image of the indicia is observed in both of the viewfinders.

3,630,134

DEVICE FOR INDICATING EXPOSURE FACTORS IN THE VIEWFINDER OF A SINGLE LENS REFLEX CAMERA

Shigeya Nakamura, Yokohama-Shi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 20, 1968, Ser. No. 766,354
Claims priority, application Japan, Aug. 28, 1967, 42/73223
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 4 Claims



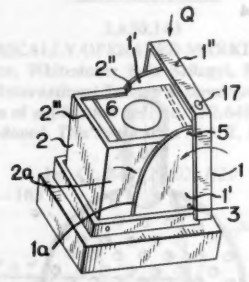
An arrangement is provided for a single lens reflex camera for indicating exposure factors in the viewfinder of the camera. The focusing screen of the camera is provided with a ledge or step portion along one side and a member for indicating the exposure factor is movable along the step portion by a thin cable or thread. The thread is moved by a pulley and reel arrangement driven by the exposure-factor-setting mechanism of the camera. Illumination of the exposure indicia is provided by the viewing mirror, and may also be provided by an auxiliary reflecting member for reflecting the light rays coming directly from the center of the exit pupil of the objective lens.

3,630,135

FOLDING-TYPE WAIST LEVEL FINDER

Akihiko Sato, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 1, 1968, Ser. No. 764,259
Claims priority, application Japan, Oct. 13, 1967, 42/88971
Int. Cl. G03b *11/04*
U.S. Cl. 95—47 3 Claims



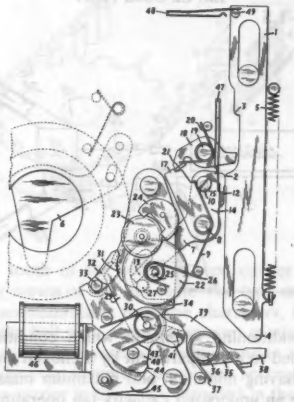
A collapsible or foldable viewing hood is provided for a single lens reflex camera. The viewing hood includes a front cover and a rear cover which are adapted to fold together through a camming arrangement upon rotation of the front cover. A magnifying lens carried in a frame and pivotable supported on the front cover, is folded into the front cover by a camming action of the rear cover. Latches are provided for the cover and for the magnifier frame to retain the folded assembly against the bias of spring elements provided for the covers and the magnifier frame.

3,630,136

EXPOSURE TIME ADJUSTING DEVICE FOR ELECTRIC SHUTTERS

Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed June 18, 1969, Ser. No. 834,331
Claims priority, application Japan, June 19, 1968, 43/42169
Int. Cl. G03b *9/00*
U.S. Cl. 95—53 R 6 Claims



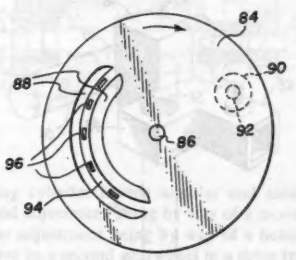
A shutter apparatus having an electrical timing circuit for controlling the open time of the shutter has an adjustable linkage in the shutter drive mechanism. The starting position of the shutter may be varied in order to make the delay time in opening of the shutter equal to the delay time in closing of the shutter.

3,630,137

CAMERA HAVING SHUTTER SPEED CONTROLLED BY LENS APERTURE

Allen G. Stimson, and Carl H. Zirngible, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 7, 1969, Ser. No. 839,594
Int. Cl. G03b *9/10*
U.S. Cl. 95—58 4 Claims



A camera has an adjustable lens aperture and a shutter member movable in a given path across the optical axis. The

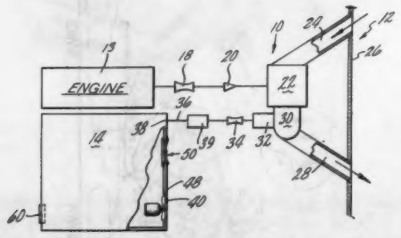
shutter member has an aperture for selectively passing light admitted by the lens aperture for exposing the film. The shutter member, has an elongated opaque member extending across the shutter aperture and aligned with the lens aperture, the width of the opaque member being substantially equal to the minimum adjustment of the lens aperture. The opaque member has a plurality of cutouts for passing light to the film as the shutter aperture moves past the lens aperture.

3,630,138

AIR-CONDITIONING SYSTEM WITH POSITIVE PRESSURIZATION

Jens Martin Anders Marcussen, West Haven, and Kenneth Martin Rosen, Guilford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 26, 1970, Ser. No. 84,090
Int. Cl. B64d *13/04*
U.S. Cl. 98—1.5 **14 Claims**



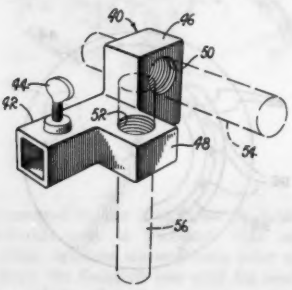
An air-conditioning system in which conditioned air is being provided to a compartment by a choked air-conditioning system having minimum and maximum mass flow rates and wherein an undersized capacity fan operating in a pressure drop condition is placed in the outlet of the compartment to insure compartment pressurization despite leakage within the anticipated range within the operational flow range of the air conditioner, and which fan will operate to create a pressure rise to pump air through the compartment upon discontinued use of the air-conditioning system, and further, wherein a pressure relief valve is utilized in parallel flow relation with the fan to protect compartment structural integrity and to maintain compartment pressure changes within the limits of human comfort.

3,630,139

COUNTERBALANCING DEVICE

Kenneth J. Wehrle, 2849 Forist Lane, Mercede, Calif.

Filed Mar. 17, 1969, Ser. No. 807,564
Int. Cl. A47j *37/04*; F16f *15/22*
U.S. Cl. 99—421 H **1 Claim**



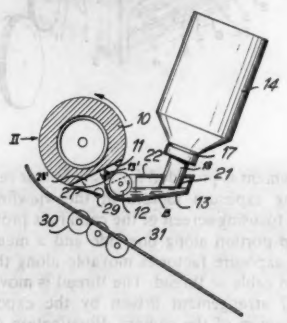
A counterbalancing device for a cooking object eccentrically mounted on a rotatably driven barbeque spit including a hub axially positionable on the spit and adapted to be locked thereon. Affixed to the hub are a pair of bosses formed with screw-threaded bores having axes which are substantially mutually perpendicular. Threaded in the bores are elongated screw-threaded weights axially adjustable by turning for precisely adjusting the weights to compensate for any imbalance of the cooking object.

3,630,140

PANCAKE-BAKING MACHINE

Paul Marrie, Dijon, France, assignor to Societe A Responsabilite Limitee dite:Etude, Quetigny, (Cote d'Or), France

Filed May 26, 1970, Ser. No. 40,567
Claims priority, application France, May 28, 1969, 6917401 Apr. 24, 1970, 7015150
Int. Cl. A21b *1/48*
U.S. Cl. 99—423 **16 Claims**



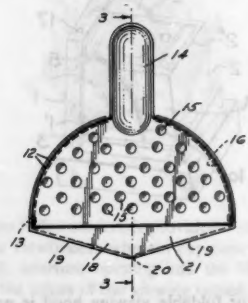
Batter from an upwardly open pan is picked up by a rotating transfer roller and spread over an adjoining heated cylinder rotating codirectionally therewith. The cylinder has a peripheral recess, serving to interrupt the transfer of the batter, and is provided near its nadir with a scraper for detaching the baked pancake from its periphery and depositing it on a conveyor or chute.

3,630,141

TABLEWARE JUICE DISPENSER

Mahmoud Amin Elshazly, 132 Schmitz Terrace, Mt. Arlington, N.J.

Filed Mar. 31, 1970, Ser. No. 24,145
Int. Cl. B30b *7/00*
U.S. Cl. 100—234 **1 Claim**



A piece of table silverware designed to supplement the usual silverware such as knife, fork and spoon and useful for neatly dispensing the juice from a lemon wedge. A pair of

hinged jaws are of a size and shape corresponding to the diverging faces of a lemon wedge. Each jaw has an extension, one for the thumb and the other for the finger, and there is a pan at the hinge side of the jaws for collecting the juice when the jaws are squeezed, the pan being closed except at a nozzle which directs the juice to the desired place.

ERRATUM

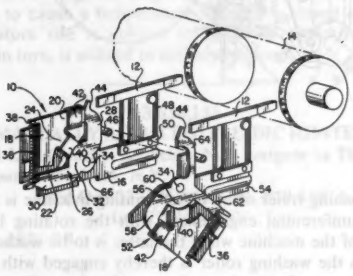
For Class 100—118 see:
Patent No. 3,630,158

3,630,142

ELECTROMAGNETIC DRIVE FOR PRINT HAMMERS

Thomas C. Fulks, Eaton, and Mushi Soraya, Dayton, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Aug. 25, 1969, Ser. No. 852,653
Int. Cl. H01f 7/04
U.S. Cl. 101—93 R **2 Claims**



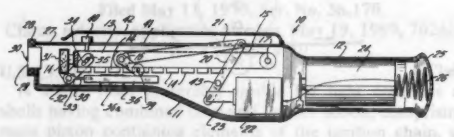
A transducer having a permanent magnet which holds a rotatable armature against the bias of a spring when the transducer is in a ready, or home, position. A coil, when energized, neutralizes the holding effect of the permanent magnet, permitting the spring to move the armature to an operative position, where it strikes a print hammer with which the transducer may be associated. The transducer is designed to produce switched magnetic fields to hold the armature in either the ready position or the operative position, making the transducer bistable. The armature is reset to the home position by an external mechanical return bar.

3,630,143

ELECTRICALLY OPERATED MARKING DEVICE

Howard Price, Whitestone; Bela Szilagyi, Flushing, both of N.Y., and International Patents & Development Corp.

Continuation of application Ser. No. 732,649, May 28, 1968, now abandoned. This application Apr. 2, 1970, Ser. No. 23,085
Int. Cl. B41j 27/02, 1/20
U.S. Cl. 101—103 **3 Claims**



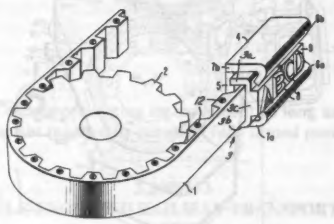
Marking device with settable characters electrically operated for stamping preset characters on the articles to be marked. A switch for operating the device is actuated upon placing the marking device on the article to be marked.

3,630,144

TYPE CARRIER TOOTHED BELT

Fritz Hilpert, Boblingen, Germany, and Guenter Schacht, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1969, Ser. No. 820,163
Claims priority, application Germany, May 14, 1968, P 17 74 268.6
Int. Cl. B41j 1/20
U.S. Cl. 101—111 **2 Claims**



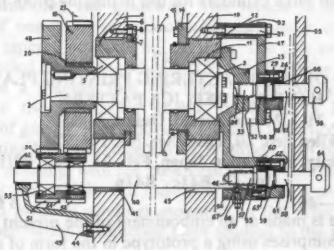
On each tooth of the belt one type carrier is pivotally mounted by means of one pin each. The type carrier, which preferably accommodates two type characters, is U-shaped, embracing the belt with a certain amount of play. The play, which exists both in a vertical direction and in the direction of firing of the print hammers, permits an accurate alignment of each type carrier in the guide provided in the printer station.

3,630,145

ANGULAR AND AXIAL ADJUSTMENT MECHANISM FOR A PRINTING CYLINDER

Pierre Leuenberger, Nantes, France, assignor to Creusot-Loire, Seine, France

Filed June 9, 1970, Ser. No. 44,802
Claims priority, application France, July 4, 1969, 6922715
Int. Cl. B41f 13/14
U.S. Cl. 101—248 **2 Claims**

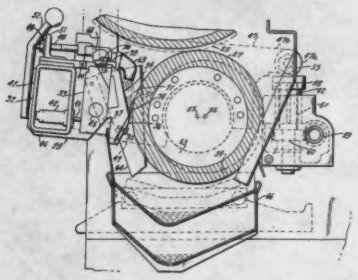


A printing cylinder having angular and axial adjustment facility, axial adjustment being by way of a movable trunnion and angular adjustment being by way of a helical gearwheel loose relative to a second gearwheel in a drive train, a double gear loose about a control shaft but axially fast thereto being operable to effect relative angular displacement of the gearwheels and the control shaft being axially fast relative to the movable trunnion.

3,630,146
INTERRUPTABLE INKING CYLINDER AND SCRAPER BLADE FORMING OPEN ENDED FOUNTAIN TROUGH

Albert F. Shields, Forest Hills, N.Y., assignor to S & S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.

Continuation of application Ser. No. 693,899, Dec. 27, 1967, now abandoned. This application Feb. 4, 1970, Ser. No. 11,619
Int. Cl. B41f *31/04, 31/36*
U.S. Cl. 101—351 10 Claims



Printing apparatus is constructed with an open-ended troughlike fountain defined by an anilox inking cylinder, a scraper blade, and a rigid support for the scraper blade. A plurality of fluid-operated power cylinders mounted directly to a common elongated manifold urge the scraper blade against the inking cylinder. A pan positioned below the fountain is shaped to catch ink flowing out of the fountain through the open ends thereof and direct such ink to the inlet of a pump which then directs the ink to a nozzle positioned above the fountain at a point midway between the ends thereof. The blade is constructed of a nonmetallic material to reduce wear of the anilox roll and improve uniformity of the ink film. Automatic means responsive to stopping of the printing cylinder moves the pressure cylinder away from the printing cylinder and also moves the entire troughlike fountain including the inking cylinder, away from the printing cylinder. An idler motor for the inking cylinder is connectable to drive all three cylinders for use in making proof prints.

3,630,147
METHOD OF MANUFACTURING PRINTING PLATES HAVING A REPLICA PATTERN

Fumio Hirai, 31-3, Minamihiraki, Osaka, Japan

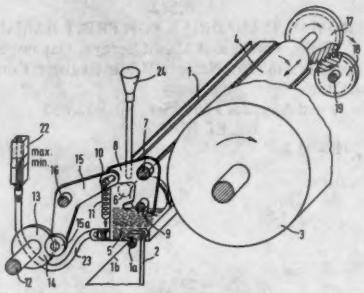
Filed Feb. 20, 1968, Ser. No. 706,974
Claims priority, application Japan, Feb. 21, 1967, 42/11058
Int. Cl. B41c ; B41n
U.S. Cl. 101—401.1 6 Claims

Disclosure is made of an embodiment of the present invention which comprises using a prototype in the form of a natural or carved object, overlaying a thin deformable material of paper or synthetic resin on the surface of said prototype to fix its surface pattern on said thin deformable material for use as a prototype plate, spraying onto this prototype plate a coloring matter from a direction of an acute angle to form an emphasized rugged-surface pattern, and photographing this prototype plate on a photographic printing plate, which is printed on a gelatinous film for being attached to an etchworkable metal so that it can be etched with an etching solution thereby obtaining a printing plate with a replica pattern and also decorative plates with said replica pattern.

3,630,148
WASHING ARRANGEMENT FOR THE BLANKET CYLINDER OF AN OFFSET PRINTING MACHINE

Heinz Schinke, Unterkirnach; Hermann Raible, and Dieter Ludin, both of St. Georgen, all of Germany, assignors to Math. Bauerle GmbH, St. Georgen, Germany

Filed Jan. 21, 1969, Ser. No. 792,317
Claims priority, application Austria, Jan. 23, 1968, A655/68
Int. Cl. B41f *35/06*
U.S. Cl. 101—425 6 Claims

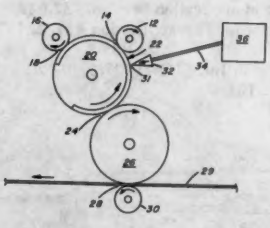


The washing roller of an offset printing machine is moved into circumferential engagement with the rotating blanket cylinder of the machine when the latter is to be washed, and a gear on the washing roller is thereby engaged with a gear rotated about a fixed axis on the machine frame for rotating the engaged portions of the roller and of the cylinder in opposite directions while they are also oscillated axially relative to each other and supplied with washing liquid.

3,630,149
LITHOGRAPHIC PRINTING PROCESS

Doyle O. Etter, and David J. De Marle, both or Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,385
Int. Cl. B41m *1/06;* B41f *9/18*
U.S. Cl. 101—450 9 Claims



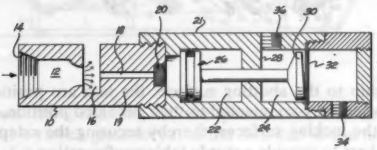
Directing gas, e.g., air, at the surface of a lithographic plate (in an amount insufficient to dry the plate) after the image transfer step but before wetting and inking in the next press cycle, provides an additional means for controlling print density and increasing press latitude.

3,630,150

ACTUATING MECHANISM

Edward L. Rakowsky, Kinnelon, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,487
Int. Cl. F42c 5/00
U.S. Cl. 102—70 2 Claims



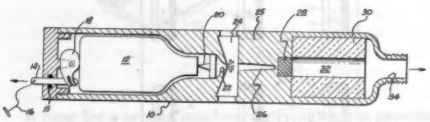
An actuating mechanism in which a source of fluid is directed against an end wall of a rigid body portion having an open cavity formed therein to create pressure waves of fluid which pass through the length of the cavity to the closed end thereof to cause a temperature rise at the closed end. This temperature rise is utilized to ignite an explosive device which, in turn, is utilized to accomplish work.

3,630,151

MANUALLY ACTUATED FLUIDIC IGNITER

Edward L. Rakowsky, Kinnelon, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,610
Int. Cl. F42c 5/00
U.S. Cl. 102—70 4 Claims



An igniter in which an enclosed source of compressed fluid is disposed in a housing, and is opened by a manually actuated lever. The resulting flow of fluid is directed towards an intermediate wall formed in the housing and into a cavity formed in the intermediate wall to create pressure waves of fluid which pass through the cavity and result in a temperature rise at the closed end of the cavity. An explosive is disposed in heat exchange relation with the closed end of the cavity and is adapted to be ignited by the temperature rise.

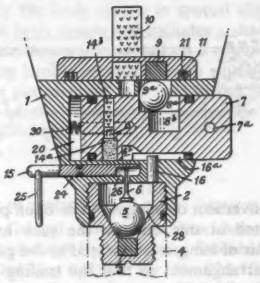
3,630,152

SAFETY FUSE WITH TIME AND IMPACT ACTION

Claes G. Arnell, Torshalla, Sweden, assignor to Forsvarets Fariksverk, Eskilstuna, Sweden

Filed May 11, 1970, Ser. No. 36,170
Claims priority, application Sweden, May 19, 1969, 7026/69
Int. Cl. F42c 9/10
U.S. Cl. 102—72 4 Claims

A safety fuse, preferably usable for light grenades and shells having combined time and impact action, comprising a main piston containing elements of the ignition chain, said piston being displaced radially in a bore in the fuse casing by a driving spring, the time of this movement being prolonged by the vacuum created behind the ring-tightened piston, said vacuum being adjustable by leak holes having an arbitrary diameter. The fuse also contains a delay-composition-containing piston that is movable toward a fixed firing pin in a direction at an angle to the main piston. The delay piston has



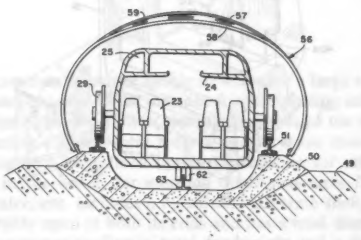
stopping means preventing its movement as long as the main piston has not reached its outward, fully armed position.

3,630,153

VEHICLE-ENCLOSED RAILWAY TRANSPORTATION SYSTEM

Henry L. Guimarin, Fort Worth, Tex., assignor to Whoosh, Inc., Fort Worth, Tex.

Filed May 5, 1969, Ser. No. 821,690
Int. Cl. B61b 13/10; B01g 7/02; F24f 7/02
U.S. Cl. 104—138 13 Claims



The system consists of a streamlined multicar vehicle and a complementary rail guideway. The vehicle is an elongated train of one or more cars of unitized tubular construction, having tapered nose and tail portions. The cars are supported on wheeled trucks, the wheels extending from the sides of the body in a manner that the body is effectively suspended between the supporting wheels to provide a low vehicle center of gravity. The guideway includes a ferroconcrete rail-supporting base structure having relatively high rigidity and a shroud defining, with the base structure, a continuous enclosure for the vehicle. An induction motor propulsion system includes primary windings mounted on the vehicle coacting with a secondary conducting plate secured to the guideway.

3,630,154

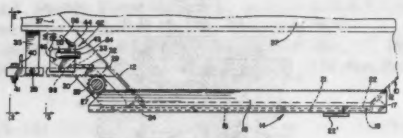
RACK-AND-PINION-ACTUATED RAILWAY HOPPER CAR GATE

William D. Mundinger, Highland, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Sept. 22, 1969, Ser. No. 859,680
Int. Cl. B61d 7/18, 7/22, 7/26
U.S. Cl. 105—282 P 7 Claims

The discharge end of a hopper positioned on a railway hopper car is provided with a closure gate. The closure gate

is movable between open and closed positions by means of a pinion and rack arrangement. The rack arrangement extends perpendicularly to one side of the hopper and is suitably suspended from the under side of the railway car structure.



During the movement of the gate to its open position it is entirely supported at one end on the rack arrangement by means of a pair of hangers connected to the gate and slidable on the rack arrangement so that the trailing or rear end of the gate is suspended thereon.

3,630,155

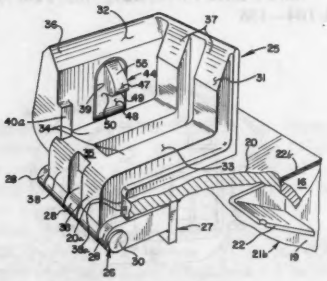
RAILROAD CONTAINER BRACKET STRUCTURE

Walter J. Marulic, Gary, Ind., and Ray L. Ferris, Thornton, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Dec. 29, 1969, Ser. No. 888,665

Int. Cl. B61d *45/00*; B65j *1/22*

U.S. Cl. 105—366 D **11 Claims**



This invention pertains to a railroad car container bracket mounted on transverse sideplate means attached periodically to the sides of the railroad car deck. The bracket is pivoted on an axis transverse to the longitudinal centerline of the car and constructed in such a manner as to prevent longitudinal, transverse, and vertical movement of a container. When the brackets are in position supporting the four bottom corners of a container the bracket will transmit impact forces to the deck of the railway car in a unique manner which shields the bracket pivot pin from damaging shearing forces. The bracket also contains a spring-loaded pivot latch which prevents dislodgement of the container in a vertical direction, especially when the container is empty and subjected to high-wind loading which tends to tip an empty container from the deck of the container car.

3,630,156

COLLAPSIBLE TABLE

William N. Woodruff, 8022 North 10th Ave., Phoenix, Ariz.

Filed Feb. 11, 1970, Ser. No. 10,466

Int. Cl. A47b *3/04*

U.S. Cl. 108—34 **7 Claims**

A collapsible table is described utilizing a continuous sheet of flexible material for a top and having a plurality of slats secured therebeneath. The slats in combination with the flexible top permit the top to be folded with the slats on the outside for convenient storage. A pair of end bars are positioned at each end of the top and include locking bars. Sideplates having legs pivotally secured thereto are placed in abutting

relationship to the abutting surfaces the legs are positioned so that when they are pivoted to their unfolded position, they contact the locking surfaces, thereby securing the sideplates and end bars to provide a sturdy table configuration.

3,630,157

PALLET

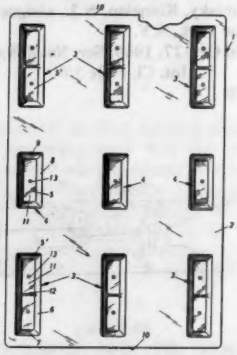
Ture Janneson Ortenblad, Brodragatan 30, S-412 74, Goteborg, Sweden

Filed June 3, 1969, Ser. No. 829,881

Claims priority, application Sweden, Feb. 6, 1969, 1633/69

Int. Cl. B65d *19/18*

U.S. Cl. 108—53 **4 Claims**



An improved loading pallet is constructed with a carrier platform of compression moldable or castable material having a plurality of boxlike recesses, the sidewalls of which converge toward the bottom of each recess. The pallets are adapted to be stacked for storage or shipment with the boxlike recesses of each pallet being received within the recesses of the pallet immediately below and receiving the recesses of the pallet immediately above.

3,630,158

CONTINUOUS PRESS, ESPECIALLY FOR SQUEEZING FRUITS

Dirk Doornhof, Maartensdijk, Netherlands, assignor to Ensink N.V. Machinefabriek En Ijzergieterij, Netherlands

Filed Oct. 9, 1970, Ser. No. 79,522

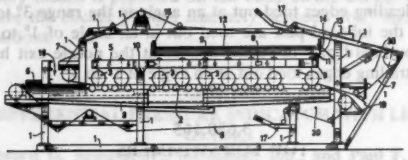
Claims priority, application Netherlands, Oct. 16, 1969, 69 15656

Int. Cl. B30b *9/24*

U.S. Cl. 100—118 **4 Claims**

A continuous press, especially for squeezing fruits with two endless pressing belts and a plurality of rotatable pressing rollers, each cooperating with two supporting rollers thereunder on either side, arranged with a small number in a first train and a greater number in a main train on a supporting frame,

said supporting frame being supported between the first and main train in such a way that it can pivot about a horizontal axis, with a pressing member being provided in order to exert



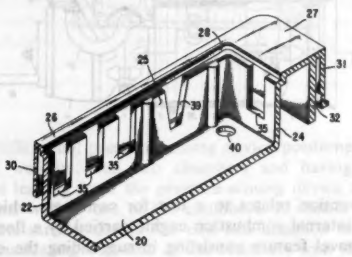
(almost independently of the position of the supporting frame) a rather great force on the free end of the main train part of the supporting frame.

3,630,159

BASE FOR A PORTABLE SEWING MACHINE CARRYING CASE

George L. Zilg, Dunellen, N.J., assignor to The Singer Company, New York, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,857
Int. Cl. B05b *75/00*
U.S. Cl. 112—258 5 Claims



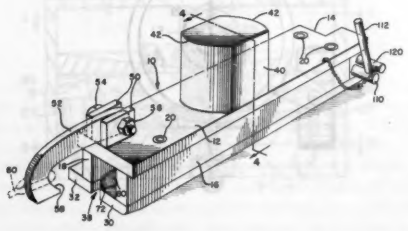
A base for a sewing machine carrying case is provided. The base is an open-topped boxlike structure which supports the sewing machine and has apertures formed in at least one of the interior walls thereof for reducing the noise produced by operation of the sewing machine.

3,630,160

METAL-JOINT-OPENING DEVICE

Carl C. Perkins, Jr., Prairie Village, Kans., assignor to Butler Manufacturing Company, Grandview, Mo.

Filed Nov. 24, 1969, Ser. No. 879,357
Int. Cl. B21d *39/00*
U.S. Cl. 113—1 K 15 Claims



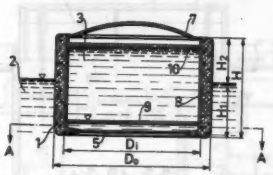
A rigid body means defines a slot extending longitudinally thereof for receiving a metal joint. A first cam means is supported by the body means at one side of the slot and defines a continuous cam surface extending longitudinally of the cam means, said surface having portions of different slope disposed at points spaced longitudinally thereof. This first cam means includes a sharp entry edge. A second cam means is supported by the body means in spaced aligned relationship to the first body means and includes a sharp entry edge. The second cam means is mounted on a rotatable shaft having an operating handle secured thereto which is engageable with a retainer pin received in a hole in the body means to limit rotation of the shaft which carries the second cam means.

3,630,161

MULTIPLE PURPOSE FLOATING CONCRETE RING

Hans Christer Georgii, Rindogatan, Stockholm, Sweden, assignor to Aktiebolaget Hydro Betong, Stockholm, Sweden

Filed May 6, 1969, Ser. No. 822,151
Claims priority, application Sweden, May 17, 1968, 6754/68
Int. Cl. B63b *35/02*
U.S. Cl. 114—0.5 T 8 Claims



A concrete structure usable in water for a large number of various purposes, as for instance for transporting and/or storing liquids having a lower density than that of the water, for protecting a given water surface against wave motions, as a floating or bottom-fixed support foundation for other structures in the water, for mooring other structures floating in the water, etc. includes a cylindrical concrete shell, which is preferably open at both its ends and has a total displacement in the water exceeding its total deadweight and is disposed in the water with its axis of symmetry substantially vertical. The wall structure of the cylindrical concrete shell includes a large number of cells usable as ballast and trim tanks for controlling the attitude and the buoyancy of the concrete shell in the water. The concrete shell or ring can be arranged floating in the water at the water surface or submerged to rest upon the sea bottom with a force determined by the amount of ballast filled into the ballast and trim tanks. When used for transporting and/or storing a liquid having a lower density than that of water, the cargo liquid is disposed in a floating position upon the water in the space enclosed by the cylindrical concrete shell.

3,630,162

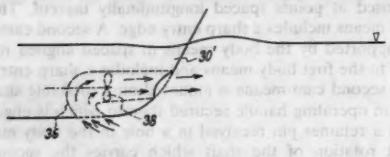
METHOD AND MEANS FOR REDUCING THE PROPELLING RESISTANCE OF VESSELS

Torbjorn H. Lundell, Grimstagatan 75, Vallinby, Sweden

Filed Feb. 17, 1969, Ser. No. 799,858
Claims priority, application Sweden, Feb. 19, 1968, 2163/1968
Int. Cl. B63b *1/06;* B63h *25/46*
U.S. Cl. 114—57 10 Claims

A method and apparatus for reducing the resistance or drag of a vessel by affecting the flow condition of the water flowing toward the stem. A flow or stream of water is positively driven forward from the stem of the vessel by a flow device in such a direction and in such a condition of motion

that it imparts to the water flowing along the vessel, by superposition, a resulting flow and wave condition of such a



character that the resistance to the propelling of the vessel is reduced.

3,630,163

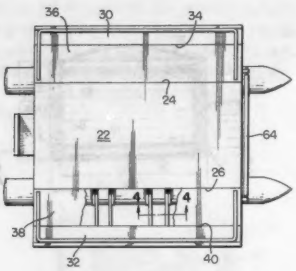
BOAT HAVING LATERALLY ADJUSTABLE DECK

Edward J. Williams, 236 Oak Knoll S.E., Warren, Ohio

Filed Aug. 4, 1969, Ser. No. 847,214

Int. Cl. B63b *1/10*

U.S. Cl. 114—61 **4 Claims**



The invention relates to a boat, especially to a pontoon-type boat, and is particularly characterized in that the deck of the boat is adjustable in the lateral direction between narrow and wide widths. The adjustment is accomplished by providing the deck with side sections, each of which can be moved from an inner position to an outer position and by providing leaf members to fill the gaps in the deck when the side sections are adjusted outwardly.

3,630,164

STEERING AND PROPULSION OF MARINE VESSELS

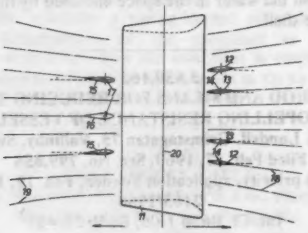
Ewan Christian Brew Corlett, Basingstoke, England, assignor to Hydroconic Limited, Basingstoke, England

Filed Jan. 20, 1970, Ser. No. 4,332

Claims priority, application Great Britain, Feb. 26, 1969, 10,296/69

Int. Cl. B63h *25/06*

U.S. Cl. 114—163 **4 Claims**



A ship's propulsion and steering assembly is provided in which a propeller works within a propulsion nozzle of the type having recirculation of flow outside the nozzle from exit to entry at low or zero speeds of advance. Steering is provided by four shutter rudders mounted at the nozzle entry and three at the exit. In the straight ahead condition of steering, the outboard pair of the rudder blades at the entry have their leading edges toed out at an angle in the range 3° to 7° while the inboard pair are toed out at an angle of 1° to 3°. The outboard pair of rudder blades at the nozzle exit have their trailing edges toed out at an angle of 1° to 3°.

3,630,165

TOW FOR SWIMMERS

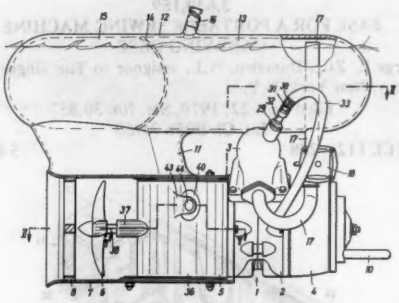
Bernd Bottger, 208 Pinneberg Stettiner Str. 6, Pinneberg, Germany

Filed Sept. 23, 1969, Ser. No. 860,295

Claims priority, application Germany, Sept. 23, 1968, P 17 18 291.8

Int. Cl. B63b *35/00*

U.S. Cl. 115—6.1 **7 Claims**



This invention relates to a tow for swimmers which includes an internal combustion engine carried by a float, the essential novel feature consisting in suspending the engine from underneath the float and providing means for sealing it from the water and supplying combustion air to the engine from the interior of the float which is connected with atmosphere.

3,630,166

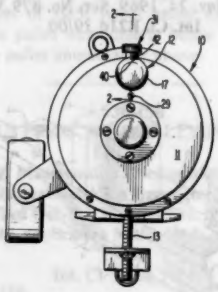
WATERPROOF CLICKER UNIT FOR FISHING REEL

Franklin D. Riddle, and Robert Kenneth Crossland, both of Greenville, S.C., assignors to Southern Machinery Company, Greer, S.C.

Filed Mar. 30, 1970, Ser. No. 23,941

Int. Cl. G08b *3/00*

U.S. Cl. 116—67 **10 Claims**



A clicker unit includes a small body having a pressed fit in an opening provided in one end plate of a fishing reel. A

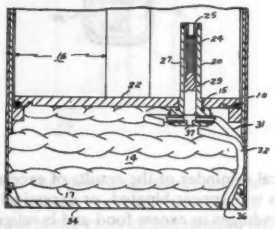
spring-urged plunger assembly is contained movably in said body including a clicker element adapted to engage spaced recesses in a rotating plate carried by the reel spool. A sealed rotary means is provided on the body of the clicker unit to move the clicker plunger assembly between "on" and "off" positions.

3,630,167

DIFFERENTIAL PRESSURE INDICATOR WITH LIGHT GUIDES

Edward G. Schultz, Jr., Richmond, Ind., and Paul F. Metz, Fairfield, Ohio, assignors to The United States of America as represented by the United States Air Force

Filed Apr. 2, 1970, Ser. No. 25,062
Int. Cl. G01l *19/12, 13/02*
U.S. Cl. 116—70 **2 Claims**



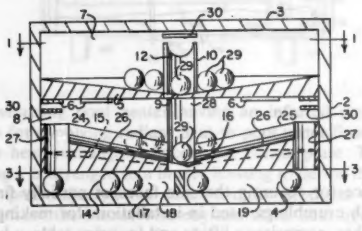
A differential pressure-sensing device positioned in an interior wall between two chambers and having two light guides leading from the pressure-sensing device through an external wall of one of the chambers. A shutter pin in the pressure-sensing device has one end attached to a bellows communicating with one of the chambers with the pressure in the other chamber acting against the end of the shutter pin. The shutter pin is movable across a light path between the two light guides so that light directed through one guide at the external wall can be seen through the other light guide when the desired differential pressure is maintained and light is blocked when the pressure difference is not at the desired level.

3,630,168

INERTIA-OPERATED INDICATING APPARATUS

Foster C. Findlay, 909 Shattuck Road, Saginaw, Mich.

Filed Feb. 17, 1970, Ser. No. 12,009
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 **10 Claims**



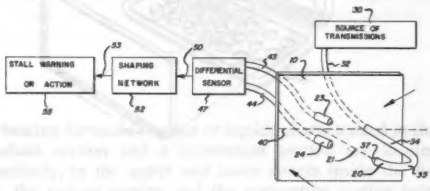
Inertia-operated apparatus for indicating unusually high rates of acceleration, deceleration and turning of a vehicle comprises a hollow body having three vertically stacked chambers, the upper and intermediate chambers having upwardly concave floors on which balls may be supported in such manner that one ball always is located at the center of the floor. The upper chamber includes a pair of ramps extending radially in opposite directions from the center of the floor and the intermediate chamber has a pair of ramps extending radially in opposite directions from the center of the floor, the ramps of the upper and intermediate chambers being normal to one another. At the upper end of each ramp is an opening which communicates with the lower chamber, and the lower chamber is provided with partitions to form four compartments, there being one compartment in communication with each of the openings in the ramps.

3,630,169

STALL WARNING INDICATOR

Victor B. Corey, Bellevue, Wash., assignor to Sundstrand Data Control, Inc.

Filed June 1, 1970, Ser. No. 41,886
Int. Cl. G01f *15/00*
U.S. Cl. 116—117 D **7 Claims**



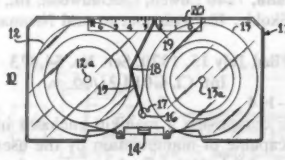
A stall warning indicator having no moving parts is mounted on a leading edge of an aircraft wing, near the point of stagnation of airflow when a stall condition occurs. The indicator includes a transmitter emitting transmissions, as a continuous acoustic wave or a jet airstream, which are received by a pair of detectors connected to a differential sensor. When the stagnation point passes the axis of the transmissions, the differential sensor produces a signal to warn of an impending stall.

3,630,170

TAPE AMOUNT INDICATOR FOR TAPE RECORDERS

Nicholas Christo, Boonton, N.J., assignor to Continental Commerce Corporation, Englewood, N.J.

Filed Apr. 14, 1970, Ser. No. 29,106
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 **4 Claims**



The present invention relates to a transparent cartridge or cassette-type tape container device which is adapted to be inserted for recording or playback into a tape recorder and in which a predetermined length of tape is stored preferably on a pair of reels, the improvement residing in the provision of

an indicator supported in the container at one end and having a pointer at the other end thereof. The pointer sweeps along a scale which is either formed on the container device or which is in the form of a strip secured to the container device. The movement of the indicator is caused by the varying amount of the tape on one of the reels as sensed by the indicator with a portion thereof abutting against the tape on the reel.

3,630,171

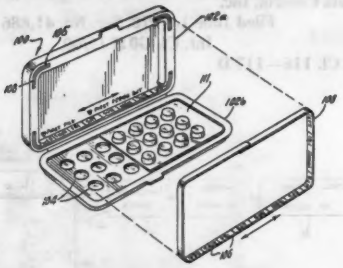
TABLET-DISPENSING DEVICE

Charles M. Huck, Bound Brook, N.J., assignor to Ortho Pharmaceutical Corporation

Original application Mar. 8, 1968, Ser. No. 711,683. Divided and this application Sept. 29, 1969, Ser. No. 871,994

Int. Cl. G09f *9/00*

U.S. Cl. 116—121 **1 Claim**



A preferred embodiment of a series of tablet dispensers is disclosed having a base containing seven columns of tablet locations and a cylindrical member rotatably mounted in the base and containing on its surface seven series of indicia of time. Each series is axially disposed and includes an indicia for each day of the week arranged sequentially with respect to time. The indicia of each series are spaced so that each indicia is registerable with a column of tablet locations. The seven series of such indicia are arranged circumferentially of the cylindrical member and each series begins with an indicia representing a different day of the week.

In using the dispenser, the cylindrical member is rotated until the day on which the first tablet is to be taken registers with the first column of tablet locations. When the indicia representing the appropriate day is registered with the first column of tablet locations, the indicia representing subsequent days register with the other columns of tablet locations.

3,630,172

DIET REMINDER MANIKIN

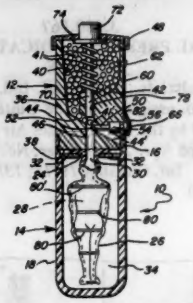
Marcel Neumann, 7240 Lowell, Lincolnwood, Ill., and Burton L. Siegal, Skokie, Ill., assignors to said Neumann, by said Siegal

Filed July 15, 1970, Ser. No. 54,873

Int. Cl. G01d *21/00*

U.S. Cl. 116—114 **16 Claims**

A structure comprising a manikin enclosed in a suitable enclosure is capable of manipulation by the user each time that a number of calories of food or grams of carbohydrate has been consumed by the user. The manipulation may take the form of dropping balls into the hollow of the manikin, or releasing a small amount of colored liquid to flow into the manikin or moving a colored member to change the appearance of the manikin. In each case the manipulation is performed during the day in such degrees that normal food intake by the user with orthodox manipulation will not result in any distortion or out-of-the-ordinary appearance of the manikin. An excess of manipulation on the other hand will make a visible change from the normal in the appearance of the manikin. This provides a reminder for the normal food consumption of the dieting user, but also provides a



psychological reminder of the results of excess. For example, the manikin will appear bloated, or excessively colored, etc., if the user indulges in excess food and is religious in manipulating the manikin for each increment of intake.

3,630,173

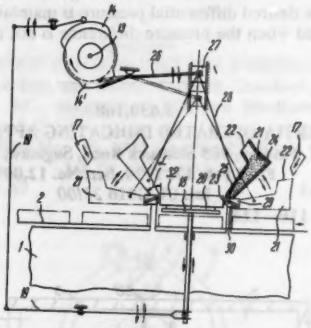
APPARATUS FOR COVERING THE SIDE FACES OF A PARTIALLY FINISHED CAKE WITH CRUMBLINGS

Oleg Grigorievich Lunin, Zeleny prospekt, 10/32, Korpus 27, kv. 17, Moscow, U.S.S.R.

Filed Nov. 10, 1969, Ser. No. 875,123

Int. Cl. A23g *3/20;* **107** *27;54*

U.S. Cl. 118—16 **7 Claims**



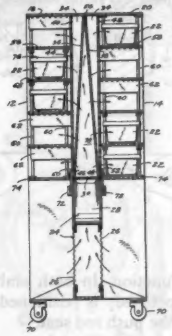
A device for covering the side faces of partially finished cakes with crumblings, used in installations for making multilayer cakes, comprises a lifting-and-lowering table, a hopper with a vibrating hopper and two boxes. The boxes are somewhat spaced from each other and have inlets and outlets in the walls of the boxes. When the boxes are in operating position the outlets for the crumblings are to the side face of the cake.

3,630,174

UNIT FOR PROVIDING ENVIRONMENTAL CONTROL OF ANIMALS

Robert S. Runkle, Allendale, N.J., and Robert Claude Marsh, Albuquerque, N. Mex., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 24, 1969, Ser. No. 801,652
Int. Cl. A01k *1/00*
U.S. Cl. 119—15 4 Claims



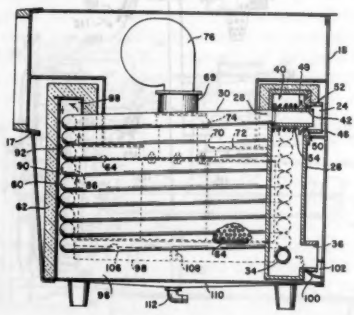
A housing unit for providing environmental control of animals which subjects confined animals to a uniform laminar airflow. Airborne cross-contamination from adjacent confined animals is prevented by means of unidirectional airflow and by baffles, which inhibit the formation of undesired turbulences and eddys and prevent passage of heavy particulate matter from adjoining cages.

3,630,175

FLUID HEATER

Edward A. Reid, Jr., and Robert G. Venendall, both of Columbus, Ohio, assignors to Columbia Gas System Service Corporation, New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,445
Int. Cl. F22b *27/08*
U.S. Cl. 122—250 R 21 Claims



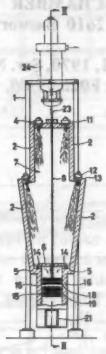
A swimming pool heater having an infrared gas burner therein for supplying radiant heat to pool water flowing in a tubular heat exchanger adjacent the burner plate. The heat exchanger is arranged in a heater housing to define therewith a flow path adjacent the tubes for the products of combustion from the burner whereby additional heat by convection is supplied to the tubes from the exhaust gases. The input end of the heat exchanger includes a valve member adapted to maintain a predetermined rate of flow of water through the tubes and to bypass excess water back to the pool.

3,630,176

TUBE FURNACE FOR HEATING

Takehiko Sato, Yokkaichi, and Saburo Fukui, Hiroshima, both of Japan, assignors to Mitsubishi Jukogyo K.K. and Mitsubishi Petrochemical K.K., Tokyo, Japan

Filed July 8, 1970, Ser. No. 53,178
Claims priority, application Japan, July 17, 1969, 44/56630
Int. Cl. F22b *21/24*
U.S. Cl. 122—356 4 Claims



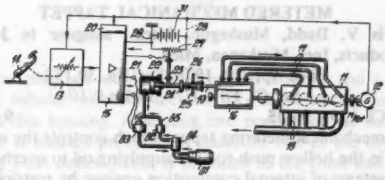
A heating furnace for gases or liquids characterized in that a radiant section and a convection section are located, respectively, in the upper and lower spaces inside the furnace, the radiant section and the convection section being separated from each other by a heat-insulating reflecting plate which is formed with passages for combustion gas, pipes disposed in a zigzag or coiled fashion are vertically suspended in the radiant section and a plurality of downwardly directed burners are mounted on the ceiling and the sidewalls of the radiant section, the pipes in the radiant section being communicated at one ends with the end of pipes disposed in the convection section and led at the other ends out of the furnace through the ceiling, and an exhaust port for the flue gas is formed open through the lower part or through a side of the convection section.

3,630,177

SPEED CONTROL FOR INTERNAL COMBUSTION ENGINE

Gerhard Engel, Stuttgart-Zuffenhausen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 3, 1969, Ser. No. 863,439
Claims priority, application Germany, Oct. 12, 1968, P 18 02 859.6
Int. Cl. F02b *3/00*
U.S. Cl. 123—32 EA 14 Claims



The position of a regulator rod controls the amount of fuel during each operating cycle by an injection pump. The posi-

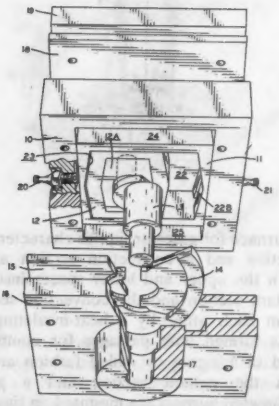
tion of the rod depends on hydraulic pressure which in turn is controlled by means of an electric valve. The electric valve responds to a control signal which is furnished by a multistage closed loop control circuit in dependence on the difference between a first feedback signal signifying the position of the regulator rod and a desired fuel injection signal varying in dependence both on the motor speed and the position of the accelerator pedal.

3,630,178

ENGINE HAVING MIGRATING COMBUSTION CHAMBER

Frederick L. Erickson, 2610 Basworth Drive, Fort Wayne, Ind.

Filed June 1, 1970, Ser. No. 42,074
Int. Cl. F02b *59/00, 75/32*
U.S. Cl. 123—50 **12 Claims**



An internal combustion engine having no connecting rod and comprising a stationary power block housing, a combustion chamber member, a working piston, and a crankshaft is disclosed wherein the reciprocating combustion chamber member contains two combustion chambers separated by a slidable double acting working piston. The working piston is connected through a rotatable bearing to a crankshaft crank pin which guides the working piston and each point on it through a circular motion relative to the power block housing. Two additional variable volume chambers are formed outside the combustion chamber member and between that member and the power block housing which allow for unique gas transferring which increases engine performance while diminishing the exhaust gas pollutants. Novel porting arrangements between the combustion chambers and the variable volume chambers are also disclosed.

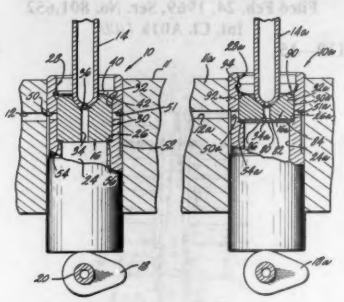
3,630,179

METERED MECHANICAL TAPPET

Morris V. Dadd, Muskegon, Mich., assignor to Johnson Products, Inc., Muskegon, Mich.

Filed Apr. 20, 1970, Ser. No. 30,152
Int. Cl. F01l *1/14;* **F01m** *9/10*
U.S. Cl. 123—90.35 **9 Claims**

A mechanical metering tappet which controls the oil pressure in the hollow push rod for supplying oil to overhead oiling systems of internal combustion engines by restricting the flow of the oil to the push rod. In one embodiment, this is accomplished by utilizing the diametral clearance of the push rod seat within its supporting cavity as the passageway for the oil from the crankcase to the reservoir. In another embodiment, the diametral clearance of the push rod seat is utilized to permit flow of oil but a metering disc used in conjunction with a specially configurated bottom surface of the seat pro-



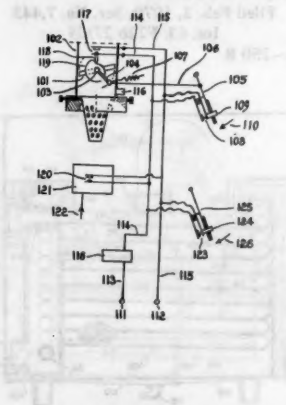
vides the metering function. In both embodiments, the oil inlet hole in the tappet body is positioned above the tappet support shoulder for the push rod seat.

3,630,180

DEVICE FOR BALANCED HOMOGENIZATION OF AIR AND LIQUID FUEL MIXTURES IN INTERNAL COMBUSTION ENGINES

Rene Bouteleux, 5 rue, Dulong, Rouen, Seine Maritime, France

Filed June 2, 1969, Ser. No. 829,218
Int. Cl. F02m *7/22*
U.S. Cl. 123—97 B **3 Claims**



The carburetor of an internal combustion engine of a motor vehicle has an idle-running jet and an air-fuel homogenizing chamber, an electrically operated fuel-admitting valve for the idle-running jet and a cam on the shaft of the air throttle of the carburetor, also an electric contact for actuating the fuel-admitting valve in connection with the clutch pedal of the wheels. The accelerator pedal of the vehicle has also an electric contact, whereby the two contacts are arranged electrically in parallel for opening the fuel-admitting valve and whereby the contact controlled by the cam closes as soon as the air throttle opens and remains closed for any opening position of the air throttle.

3,630,181

IGNITION DISTRIBUTOR FOR MOTOR VEHICLES

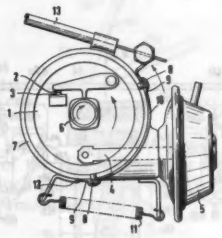
Helmut Orlich, Wolfsburg; Christoph Voges, Algermissen uber Hildesheim; Gunter Buchmuller, Wolfsburg, and Horst Reinert, Fallersleben, all of Germany, assignors to Messrs. Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of application Ser. No. 784,660, Dec. 18, 1968, now abandoned. This application Oct. 14, 1970, Ser. No. 80,743

Claims priority, application Germany, Dec. 23, 1967, P 15 76 694.6

Int. Cl. F02p *5/04*

U.S. Cl. 123—117 A 10 Claims



The vacuum governor box is mounted free to move on the distributor housing. Linkage connected to the accelerator pedal moves the box in dependence on the position of the pedal so as to advance the spark, or begin to advance it, at a time before the throttle valve moves from its idling position.

3,630,182

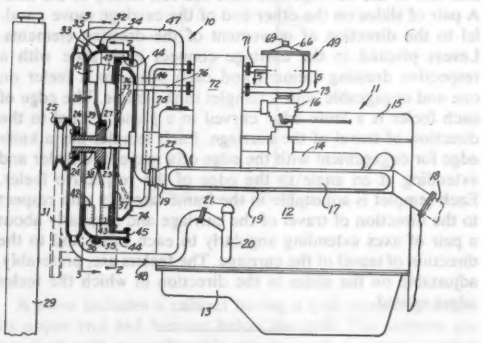
ANTIPOLLUTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Lewis M. D. Grainger, Route # 1, Glen Allen, Va.

Filed June 17, 1970, Ser. No. 46,938

Int. Cl. F02f *9/02*; F02m *25/06, 23/06*

U.S. Cl. 123—119 B 5 Claims



An antipollution system for internal combustion engines in which a blower-forming part of the fan blade of the engine draws fumes from the crankcase of the engine and feeds the fumes along with fresh air through a heat exchanger to heat the gases and then to an oil bath air cleaner air intake of the carburetor. A portion of the fumes and air are fed to an exhaust-gas-pollution-burning device.

3,630,183

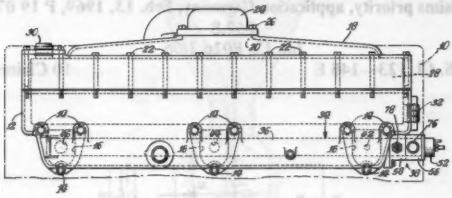
DIESEL ENGINE MANIFOLD AIR PREHEATER

Jack Hoffman, Carmel, Ind., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Jan. 26, 1970, Ser. No. 5,606

Int. Cl. F02m *31/04*; F02n *17/02*

U.S. Cl. 123—122 G 3 Claims



An air preheater preferably associated with an intercooler mounted and lengthwise of air intake manifold; and including an elongated burner tube mounted in and lengthwise of the manifold and provided with a plurality of longitudinally spaced apertures, and a burner head assembly at one end of the burner tube.

3,630,184

GLOW PLUG

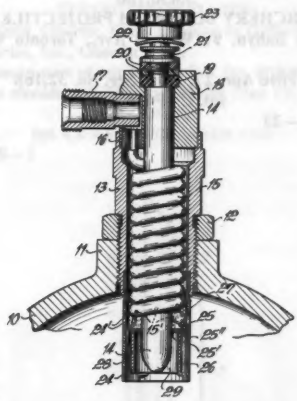
Karl Wolf, Stuttgart-Sonnenberg; Helmut Weyl, Bietigheim, and Otto Beesch, Stuttgart-Sonnenberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 16, 1970, Ser. No. 3,386

Claims priority, application Germany, Jan. 28, 1969, P 19 03 999.7

Int. Cl. F02m *57/00*

U.S. Cl. 123—145 9 Claims



A glow plug has an elongated tubular housing and a convoluted tubular member located in and extending axially through this housing. A leading end portion of the tubular member is located proximal to the front end of the tubular housing. Fuel outlet means is provided in the front end portion and fuel inlet means are provided in the tubular member rearwardly of the outlet means. A glow pin extends through the center of the helix constituted by front tubular member and is electrically energizable for thereby indirectly heating fuel passing through the tubular member from the inlet

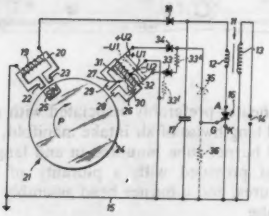
means to the outlet means so that such fuel issues from the outlet means as flammable fuel vapor.

3,630,185

IGNITION-TIMING APPARATUS

Gunter Struber, Stuttgart, and Jurgen Wesemeyer, Stuttgart-Vaihingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 9, 1970, Ser. No. 9,782
Claims priority, application Germany, Feb. 13, 1969, P 19 07 067.8
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **10 Claims**



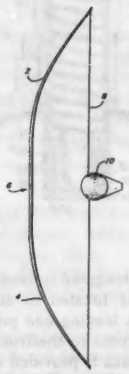
Two electrically different windings are successively influenced by a magnetic flux and generate different successive voltage pulses, of which the first generated pulse has a lower peak value. The pulses are transmitted to the control electrode of an electronic switch which controls an ignition coil and a spark plug. At low-starting speeds, the first voltage pulses are below the threshold voltage of the switch so that the spark is caused later by the second voltage pulse. At the high-normal speed of the combustion engine, the first voltage pulse exceeds the threshold voltage, and the spark is earlier produced.

3,630,186

ARCHERY BOW WITH PROJECTILE

Walter John Babyn, 91 Watson Ave., Toronto 9, Ontario, Canada

Filed Apr. 27, 1970, Ser. No. 32,168
Int. Cl. F41b *5/00*
U.S. Cl. 124—23 **6 Claims**



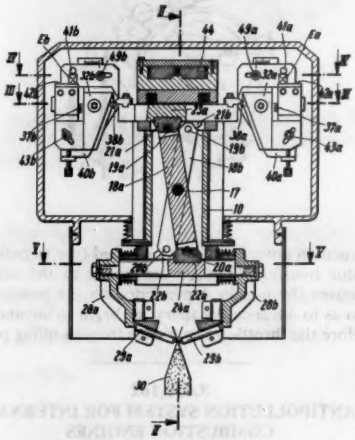
A bow and missile device, the bow having a central opening integrally therein, so that a missile when impelled by the bowstring passes through the central opening. The missile is of spherical or other solid configuration, and has a pair of wings affixed to a slit in the missile so that the wings may be folded around the bow string and be grasped by the user to facilitate propelling the missile by means of the bowstring, through the central opening in the bow.

3,630,187

TRUEING DEVICE FOR GRINDING DISCS

Engelbert Vossebrecher, Huckeswagen, Germany, assignor to W. Fer[illegible] Klingelnberg & Sohne, Germany

Filed June 30, 1970, Ser. No. 51,192
Claims priority, application Germany, July 4, 1969, P 19 34 035.3
Int. Cl. B24b *53/08*
U.S. Cl. 125—11 P **10 Claims**



An apparatus for dressing a grinding disc and, in particular, for dressing the flanks of a grinding disc for a worm or thread grinding machine. The apparatus has a stationary frame and a carriage is movable in the frame radially of the disc. A pair of opposed dressing elements are carried on the disc end of the carriage and slide thereon axially of the disc. A pair of slides on the other end of the carriage move parallel to the direction of movement of the dressing elements. Levers pivoted in the carriage connect each slide with a respective dressing element and each slide has a feeler on one end engageable with a templet in the frame. The edge of each feeler is a knife edge curved in a plane normal to the direction of travel of the carriage. Each templet has a knife edge for engagement with the edge of a respective feeler and extending at an angle to the edge of the respective feeler. Each templet is adjustable in the frame laterally with respect to the direction of travel of the carriage and angularly about a pair of axes extending angularly to each other and to the direction of travel of the carriage. The feelers are, preferably, adjustable on the slides in the direction in which the feeler edges extend.

3,630,188

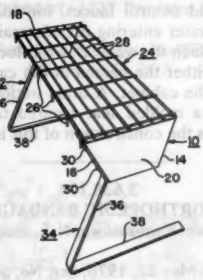
CHARCOAL COOKING GRILL

Hugh Ross, 820 Camp Horne Road, Pittsburgh, Pa.

Filed Feb. 12, 1970, Ser. No. 10,734
Int. Cl. A47j *37/00*; **F24b** *3/00*
U.S. Cl. 126—25 R **1 Claim**

A charcoal cooking grill comprising an elongated trough for receiving charcoal and having a grill fitted over its top. Connected to the trough is a single set of legs, each having an inclined, generally vertical portion and a horizontally extend-

ing dogleg portion which rests on a supporting surface. With this arrangement, the grill may be fitted into the opening in a home fireplace without removing a grate from the hearth, the

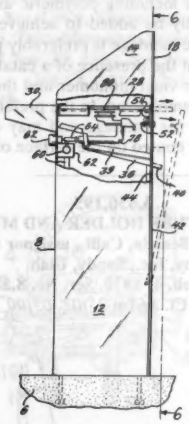


dogleg portions of the legs fitting under the grate. Furthermore, a pair of such grills may be fitted within the hearth in tandem without removing the grill.

3,630,189
STOVE

Ralph R. Hodges, and Adrian F. Bauer, both of Belleville, Ill., assignors to Empire Stove Company, Belleville, Ill.

Filed Mar. 2, 1970, Ser. No. 15,769
Int. Cl. A47j *37/00*; **F24c** *3/00*
U.S. Cl. 126—41 R **8 Claims**

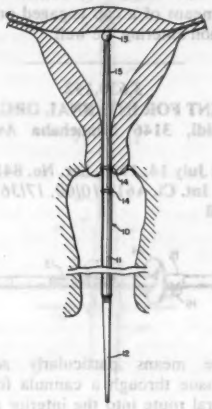


A stove includes a cabinet having a grill extending across its upper end and burners below the grill. The burners are supplied with a combustible gas through a supply conduit having a solenoid shutoff valve and adjustable control valves thereon. The solenoid valve is energized by a battery and a coin-operated timer switch is interposed between the battery and the coil of the solenoid valve. The cabinet has a removable access panel which provides access to the various components in the interior thereof. The grill is mounted in slideways, and its end is normally blocked by the access panel. However, when the access panel is removed, the grill can be withdrawn from the cabinet. A grease tray is mounted within the cabinet beneath the grill and burners, and that tray slopes downwardly toward the access panel and terminates at a discharge spout which projects through the access panel.

3,630,190
INTRAUTERINE PROBE

Samuel A. Baker, Great Neck, N.Y., assignor to Julius Schmid Inc., New York, N.Y.

Filed Mar. 13, 1970, Ser. No. 19,245
Int. Cl. A61b *5/10*
U.S. Cl. 128—2 **5 Claims**

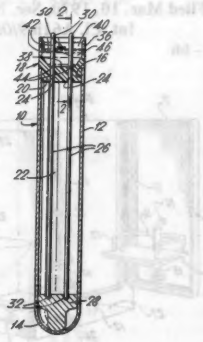


A presterilized intrauterine probe manufactured from a biologically inert plastic material is described which device is particularly adapted to probe the cervical canal and uterus to determine whether the uterus is anteverted or retroverted and to determine the distance between the cervical os and the fundus of the uterus. This intrauterine probe comprises a flexible stem portion having annular calibrated means and handle means at the proximal end of said stem portion.

3,630,191
APPARATUS AND METHOD FOR FILLING CAPILLARY TUBING WITH FLUIDS

Saul R. Gilford, Oberlin, Ohio, assignor to Gilford Instrument Laboratories, Inc., Oberlin, Ohio

Continuation-in-part of application Ser. No. 803,031, Feb. 27, 1969, now abandoned. This application May 15, 1969, Ser. No. 830,185
Int. Cl. A61b *5/00*; **A61m** *1/00*
U.S. Cl. 128—2 **21 Claims**



A plurality of lengths of evacuated capillary tubing having their ends sealed is mounted in a container with one end protruding from the closure of the container. The closure has a well formed by an upper collar, the small upper sections of

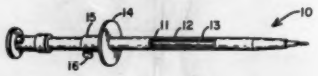
the lengths of tubing extending through the closure and the well and being scored at the bottom of the well above the transverse wall or plug thereat. When used, blood or the like fluid is deposited in the well, the upper end of each protruding section of the lengths is given a lateral strain so that the portion breaks off under the surface of the fluid, and the vacuum in the hollow bore of the length of capillary tubing draws the fluid into itself. The lateral strain is effected manually or by means of a cap engaged on the closure and having an extension entering the well.

3,630,192

INSTRUMENT FOR INTERNAL ORGAN BIOPSY

Khosrow Jamshidi, 3146 Minnehaha Ave., Minneapolis, Minn.

Filed July 14, 1969, Ser. No. 841,276
Int. Cl. A61b *10/00, 17/36*
U.S. Cl. 128—2 B **10 Claims**



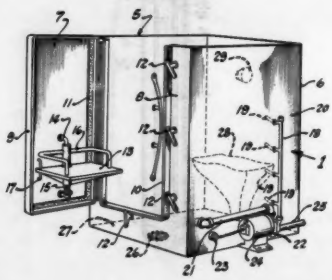
Biopsy needle means particularly adapted for the withdrawal of tissue through a cannula forced through or along an unnatural route into the interior of a live body or organ such as thyroid, spleen, or a tumor mass, the means comprising, in combination, a biopsy needle including a generally hollow axially flexible elongated needle having a generally uniform cylindrical configuration with an internal core of substantially constant internal diameter extending throughout the major portion of the axial length of the needle, said needle having a tapered distal tip with a cutting surface formed along the edges of the tip, the needle having substantial axial flexure, stylet means having an external configuration generally matching the configuration of said core and arranged to be received within the core of said hollow needle, the stylet means comprising a rigid shaft having a closed sharp tip arranged to extend distally from the tapered distal tip when the stylet is received within the core of the hollow needle. In addition, the biopsy needle means is provided with a sheath which has substantial axial flexure for accommodating relative motion of various organs within the body, and reducing or eliminating the occurrences of bleeding complications.

3,630,193

THERAPEUTIC BATHING CABINET

Joyce M. Lancaster, P. O. Box 442, Wagoner, Okla.

Filed Mar. 10, 1970, Ser. No. 18,034
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **6 Claims**



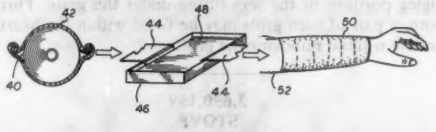
A rectangular open top cabinet having a rectangular door hinged on one side thereof. The aforesaid door is provided with a spring-loaded seat on the inside thereof for a person using the cabinet. The cabinet is provided with a vertically disposed water supply pipe having a plurality of outlets in one end of the cabinet for providing recirculating water. The just-mentioned pipe is connected to a valve to which is also connected a water-circulating pipe having its outlet in the lower end of the aforesaid cabinet. Flow of water from the water filling pipe is controlled by a sensing device that is connected to an electrically operated water pump that is also connected to the aforesaid valve of this invention. A manually operated control faucet, for controlling the temperature of the water entering the aforesaid cabinet and the pressure under which the water flows, is located so that it can be operated by either the person in the cabinet or by an attendant outside the cabinet. A drain outlet in the bottom of the cabinet and a molded seat secured to one wall of the cabinet completes the construction of this invention.

3,630,194

ORTHOPEDIC BANDAGE

Franklin Boardman, Englishtown, N.J., assignor to Johnson & Johnson

Filed May 22, 1970, Ser. No. 39,754
Int. Cl. A61l *15/07*
U.S. Cl. 128—90 **25 Claims**



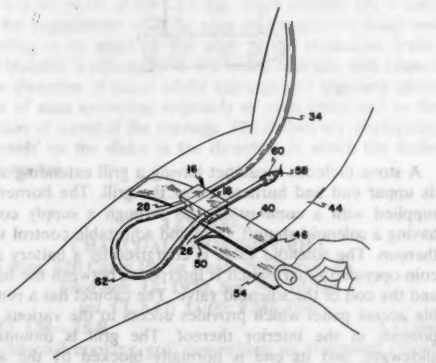
This orthopedic bandage for immobilizing or supporting portions of the body comprises a flexible carrier such as cotton gauge supporting a solid, water-soluble vinyl monomer selected from the group consisting of diacetone acrylamide and N-isopropyl acrylamide and mixtures thereof. Other monomers and fillers including polymeric and reactive substances may optionally be added to achieve particular properties or results. The bandage is preferably prepared for use by dipping in water in the presence of a catalyst for initiating polymerization of the vinyl monomer and then wrapping the body portion to be immobilized. In the preferred practice the initiator is a part of the bandage and may either be mixed with the monomer or coated on the surface of the bandage.

3,630,195

INFUSION TUBE HOLDER AND METHOD

Louis S. Santomieri, Benicia, Calif., assignor to Deseret Pharmaceutical Company, Inc., Sandy, Utah

Filed Feb. 4, 1970, Ser. No. 8,573
Int. Cl. A61m *25/02, 05/00*
U.S. Cl. 128—133 **3 Claims**



Method and apparatus adhesively holding a looped infusion tube adjacent a venipuncture site, the apparatus includ-

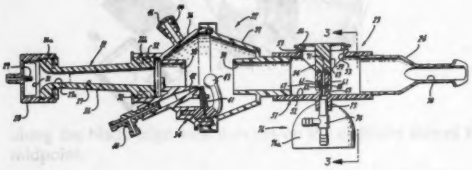
ing a generally flat body member carried upon an adhesive strip and opposed tube receiving recesses.

3,630,196

MANUAL POSITIVE PRESSURE BREATHING DEVICE

Forrest M. Bird, 212 N. W. Cerritos, Palm Springs, Calif., and Henry L. Pohndorf, 1227 Brewster Drive, El Cerrito, Calif.

Filed Aug. 22, 1969, Ser. No. 852,186
Int. Cl. A62b 7/02
U.S. Cl. 128—145.8 8 Claims



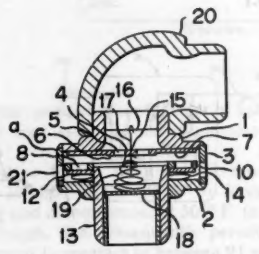
A manual positive pressure breathing device in which the mainstream gas flow is in axial alignment to provide a laminar flow and utilizing a nebulizer and a manually operated exhalation valve which is located adjacent to the patient's airway.

3,630,197

RESPIRATORY VALVE OF NONREBREATHING TYPE FOR USE IN ANAESTHESIA APPARATUS

Tukiko Hirano, No. 139-1, Shimo-Fukuman, Hachiman-cho, Tokushima-shi, Tokushima-ken, Japan

Filed Nov. 29, 1968, Ser. No. 780,105
Int. Cl. A61m 17/00
U.S. Cl. 128—188 10 Claims



This respiratory valve of nonrebreathing type consists of a one-way inspiratory valve for gas coming from the gas-feeding mouth and a expiratory valve capable to close gas exhaust induction holes in a expiratory valve seat when pressed by the spring, both provided in a valve casing which includes at one end a gas-feeding mouth connected with a anesthesia apparatus and at the other end a delivery mouth to be connected with a patient. When the patient inhales the inspiratory valve opens while the expiratory valve closes so that the anesthetic gas is fed to the patient from the apparatus, and when the patient exhales the inspiratory valve closes while the expiratory valve opens to release the breathing out into the open.

3,630,198

CATHETER PLACEMENT DEVICE

Melvyn L. Henkin, 19640 Greenbriar Drive, Tarzana, Calif.

Filed June 23, 1969, Ser. No. 835,560
Int. Cl. A61m 5/00
U.S. Cl. 128—215 4 Claims

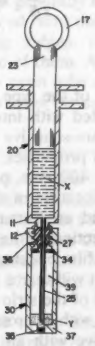
A catheter placement device including a Teflon catheter with an imperforate, generally hemispherical tip and two laterally opening ports adjacent the tip, the catheter being telescoped onto a cannula which bears against an annular internal shoulder behind the tip and communicates with the ports. The device is gripped by handles attached either directly to a hub on the cannula or to an adapter releasably connected to the hub, and is inserted through a shallow incision made with a disposable introducer formed in one piece with a troughlike pointed shank and an integral grip which centers the thrust of insertion on the shank. A capillary tube and a syringe are included as alternative sensing devices for communicating through the cannula with the ports to determine when a change in condition occurs during placement.

3,630,199

UNITIZED INJECTION SYSTEM

Louis P. Gangarosa, 3055 Eton Ct., Augusta, Ga.; Eugene J. Gangarosa, 5305 Greencastle Way, Stone Mountain, Ga., and Parker E. Mahan, 2344 Burnt Creek Road, Decatur, Ga.

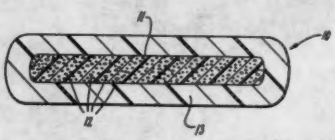
Filed May 26, 1970, Ser. No. 40,663
Int. Cl. A61m 5/00
U.S. Cl. 128—218 M 6 Claims



A disposable syringe including a barrel having one medicinal solution therein and a cannula extending

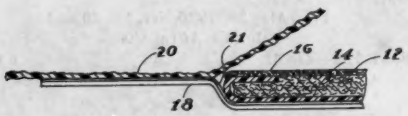
therefrom, and a vial removably attached to the barrel and receiving the cannula for isolated storage of a second medicament. With the barrel and vial in assembled, storage position, the syringe cannula tip is imbedded in a plug fixedly attached to the bottom wall of the vial, thereby preventing intermixing of the substances. However, when the parts are manipulated to a mixing position the cannula tip is withdrawn from the plug and air is introduced into the vial, thereby permitting a quantitative mixing of the substances under favorable pressure conditions. After mixing the syringe is removed completely from the vial, used in the regular manner, and the entire system thrown away.

3,630,200
OCULAR INSERT
Takeru Higuchi, Lawrence, Kans., assignor to ALZA Corporation
Filed June 9, 1969, Ser. No. 831,481
Int. Cl. A61m *31/00*
U.S. Cl. 128—260 **22 Claims**



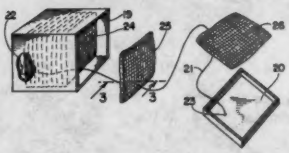
Drug dispensing ocular insert for insertion into the cul-de-sac of the conjunctiva between the sclera of the eyeball and the lid to dispense drug to the eye over a prolonged period of time is rendered more compatible with the eye and surrounding tissues by fabricating the insert of an inner core containing the drug and a soft hydrophilic outer layer.

3,630,201
FASTENING ARRANGEMENT FOR DISPOSABLE DIAPERS
Dan D. Endres, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 11, 1969, Ser. No. 848,995
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **8 Claims**



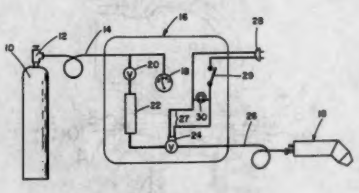
A disposable diaper of the type having an impervious thin film backing is provided with integral fasteners comprising narrow strips of pressure-sensitive tape characterized by particularly advantageous properties. The tape has an adhesive mass strength of over 400 gms. per ¾ inch width, a tensile strength in the long direction of the strip of at least 10 lbs. per inch of width, and an Elmendorf tear of at least 150 grams in the cross direction of the strip. One end of the strip is attached to the thin film backing of the diaper and adheres thereto so firmly that it will tear a 1 mil thick film rather than release. The other end of the strip extends beyond the diaper edges and is covered with a protective release sheet which adheres to the adhesive with an attachment force of from about 50 to about 300 gms. per ¾ inch of width. This latter force is sufficient to retain the protective sheet on the strip during processing and handling but will permit stripping the sheet off the adhesive without damaging the adhesive, the film backing, or the strip itself when the diaper is ready for use.

3,630,202
SYSTEM FOR HANDLING SURGICAL SPONGES
Sidney Robert Small, 11633 San Vicente Blvd., Suite 104, Los Angeles, Calif.
Filed Oct. 3, 1969, Ser. No. 863,469
Int. Cl. A61f *13/00*
U.S. Cl. 128—296 **4 Claims**



A system for handling surgical sponges in order to assure removal of those used during a surgical operation without the necessity of counting includes a line such as a flexible thin steel or nylon wire to which a plurality of sponges are serially coupled. A portion of the line is at all times held exterior to the incision, the sponges themselves being captive on the line. Sufficient line slack is available to permit a surgeon to utilize and manipulate the sponges within the incision without separation of the sponges from the line. Removal of all of the sponges used in the surgery is assured by tracing the location of the sponges from the exterior portion of the line and removing them with the line prior to closure.

3,630,203
CRYOGENIC BIOLOGICAL APPARATUS
Martin S. Sellinger, Livingston, N.J.; Robert B. Currie, Bethlehem, Pa., and Henry F. Villaume, Intervale, N.H., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Dec. 11, 1969, Ser. No. 884,071
Int. Cl. A61b *17/36*
U.S. Cl. 128—303.1 **9 Claims**

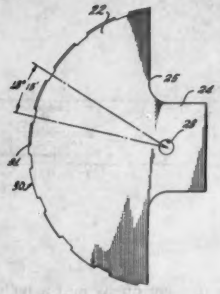


A spray-type cryogenic probe including a dual stream, cryogenic liquifier for converting stored gas into an ultracold liquid which is ejected from the probe in a fine, controlled stream to freeze tissue.

3,630,204
BLADE FOR BONE REAMER
Meyer Fishbein, 12020 Saltair Pl., Los Angeles, Calif.
Filed June 24, 1970, Ser. No. 49,301
Int. Cl. A61b *17/32;* **B23b** *51/10;* **B23d** *77/00*
U.S. Cl. 128—305 **5 Claims**

A bone-cutting blade with a convex scraper edge, rotatable about an axis which is in the plane of the blade and which intersects the midpoint of the convex scraper edge, the convex scraper edge having spaced notches therein, alternating with

arcuate blade edge segments, with segments one side of the midpoint of the arcuate blade corresponding in position



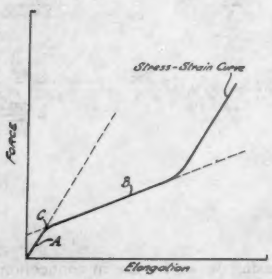
along the blade edge with notches on the opposite side of the midpoint.

3,630,205

POLYPROPYLENE MONOFILAMENT SUTURES

Gregory J. Listner, Kendall Park, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed July 31, 1969, Ser. No. 846,412
Int. Cl. A61l *17/00*
U.S. Cl. 128—335.5 3 Claims



A flexible, uniform monofilament of isotatic polypropylene having an improved hand and an ultimate elongation greater than 35 percent is prepared by extruding isotatic polypropylene having a weight average molecular weight between 299,000 and 316,000 to form a monofilament, stretching said monofilament at 300° F. to about 6.6 times its original length, and subsequently permitting the stretched monofilament to contract to between 91 percent and 76 percent of its stretched length.

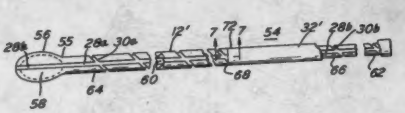
3,630,206

BLADDER CATHETER

Bruce Gingold, 4046 Ford Road, Philadelphia, Pa.

Filed Jan. 2, 1970, Ser. No. 259
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 B 10 Claims

A bladder catheter for males including an elongated flexible core element having first and second end portions and an outer surface provided with one or more grooves extending along said element, means at the first end portion of said element for being received and retained within the bladder of a subject to be treated, and a flexible tubular member with an opening therethrough for being received about said core element, whereby after said element with its member about it are inserted into the urethra of the subject with the first end of the element received and retained within the bladder, the member is partially withdrawn from about the element to an



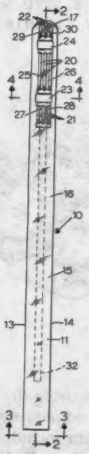
extent allowing the urethra to be flushed by the draining urine while still remaining in position over the second end portion of the element to receive the urine into the member for external disposal.

3,630,207

PERICARDIAL CATHETER

Paul Kahn, and Mogens L. Bramson, both of San Francisco, Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Aug. 8, 1969, Ser. No. 848,510
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 R 7 Claims



The pericardial catheter has a main tube, flat in cross section, open at one end and closed at the other. The top wall is flat and the bottom wall is generally flat, having a plurality of openings near to but spaced from the closed end. A plurality of lengthwise extending ridges lie between successive openings and on each end of them. A round collapse-prevention member is inside the main tube and has an outer diameter at least as great as the inner distance between the top and bottom walls.

3,630,208

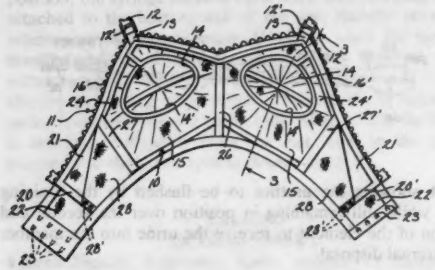
BRASSIERES

Irene E. Werth, 5032 North 60th St., Milwaukee, Wis., and Zella J. Balow, 3810 Nimitz, Eau Claire, Wis.

Filed July 9, 1969, Ser. No. 840,314
Int. Cl. A41c *3/10*
U.S. Cl. 128—484 1 Claim

An insert liner adapted to be detachably or permanently secured in a brassiere, said insert being provided with cutout portions through which a portion of the wearer's breasts project, said breast-encircling insert lining providing support beneath the breasts to create a desired uplift of the breasts as

well as distributing the weight uniformly to alleviate the strain on the shoulder straps and promoting the comfort as



well as the appearance of the wearer, said insert being readily adaptable for use in existing brassieres as well as in either strapless or strap-type brassieres and other garments.

3,630,209

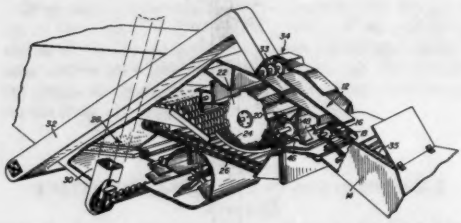
FEED CONTROL SYSTEM FOR COMBINE

Stewart F. Metzger, Route #4, and Wallace T. Dirks, 1723 Nixon Ave., both of Nampa, Idaho

Filed Jan. 8, 1970, Ser. No. 1,375

Int. Cl. A01f *12/52*

U.S. Cl. 130—27 F 2 Claims



A mechanism for improving the efficiency of threshing in a combine between a feed conveyor chain and a threshing cylinder. The mechanism includes a paddle wheel disposed between the chain and the cylinder for smoothly force feeding material from the chain onto the rasp bar surface of the cylinder. The housing of the conveyor chain has a door formed on the upper end thereof for permitting the return of incompletely threshed material onto the conveyor chain. This allows the mixing of the incompletely threshed material with the unprocessed material riding on the conveyor chain thereby substantially decreasing the likelihood of damage to incompletely threshed material as it becomes redelivered to the threshing cylinder via the paddle wheel.

3,630,210

SMOKING ARTICLES

Fred Haslam, Southampton, England, assignor to Brown and Williamson Tobacco Corporation, Louisville, Ky.

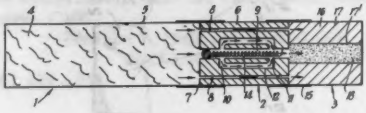
Filed Sept. 19, 1969, Ser. No. 859,388

Claims priority, application Great Britain, Nov. 27, 1968, 56,325/68

Int. Cl. A24d *01/04*; A24f *07/04*

U.S. Cl. 131—261 B 3 Claims

A smoking article or attachment is provided with means by which a puff is divided automatically into a first portion and at least one later portion and the smoke portions produced are differentially and/or separately filtered. The puff-dividing means may be a valve device subject to the suction produced by the puff and arranged to control the opening of a smoke passage additional to a constantly open smoke passage. The



constantly open passage opens into a high-density filter region and the additional passage into a lower-density filter region.

3,630,211

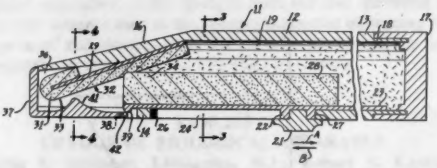
EYE SHADOW POWDER DISPENSER

David Seidler, 69-10 108th St., Forest Hills, N.Y.

Filed Jan. 6, 1970, Ser. No. 866

Int. Cl. A45d *40/30*

U.S. Cl. 132—88.5 2 Claims



A dispensing device for use in connection with applying a flowable material to a surface such as an eyelid, has a walled casing structure closed at one end thereby holding the particular material and open at the other so as to form an exit passage for the material. Means operable to open and close the exit passage and means for dispensing and applying the material, comprise an applicator that moves in opposite directions by moving means so as to receive the material some of which is applied to the surface and wiper means operable to remove any excess material from the applicator prior to application to said surface.

3,630,212

PREVENTION AND REMOVAL OF SULFUR DEPOSITS DURING THE PIPELINE TRANSPORTATION OF A SULFUR-OIL SLURRY

Godfrey Q. Martin, Moraga, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed May 26, 1969, Ser. No. 827,937

Int. Cl. B08b *9/02*

U.S. Cl. 134—22 C 12 Claims

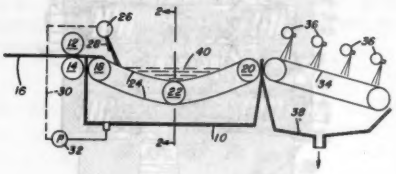
Method of preventing and removing sulfur deposition on the interior of pipe walls during the transportation of sulfur liquid-hydrocarbon slurries through pipelines by intermittently purging the lines with a neat liquid hydrocarbon under conditions capable of recovering and solubilizing any deposited sulfur on the pipe walls and thereafter repeating the cycle.

3,630,213

WEB TRANSPORT APPARATUS

Frederick H. Bruno; Raymond J. Camp, and Thomas H. Farrell, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1969, Ser. No. 863,531
Int. Cl. B65h 5/02; B65g 37/00; B08b 11/02
U.S. Cl. 134—64 10 Claims



Web transport apparatus for positively driving a web having a soft and tacky emulsion surface when wet, through a processing bath by contacting only the rear web surface after the web is wet. The apparatus comprises a horizontally arranged fluid-containing tank with a pair of input rolls disposed along one side of and above the tank which are arranged to form a nip to drive the web into the tank. A pair of horizontally spaced belt support rolls are horizontally disposed in the tank with the first belt support roll adjacent said input rolls and the second belt support roll being disposed adjacent the side of said tank opposite from the first belt support roll. A horizontal belt idler roll is disposed in the tank between the belt support rolls and has an upper surface disposed below the upper surfaces of the belt support rolls. A web-carrying endless belt member is disposed in the tank and extends substantially across the width thereof in one direction, and around the belt support rolls and the lower surface of the idler roll in the other direction. The belt member has sufficient slack in the length thereof so that the upper span may be depressed below the upper surfaces of the belt support rolls. A first fluid supply is disposed above the first belt support roll and is arranged to apply a curtain of activator fluid to the web on the upper surface of the belt. The belt cooperates with the ends of the tank to form a flow path between at least one edge of the belt and the tank. The flow path is arranged, with respect to the flow from the first fluid supply, to limit the flow from the top of the belt whereby a pool of liquid is formed on the top span of the belt and the weight of the liquid pool depresses the belt into driving engagement with the driven roll. A second fluid supply is disposed above the second belt support roll and is arranged to apply a curtain of washoff fluid to the web beyond the end of the belt and outside of the tank. Apparatus is arranged outside of the tank adjacent the second belt support roll for washing and drying the web.

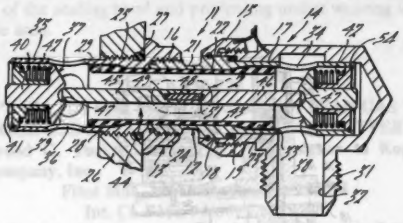
3,630,214

FRANGIBLE COUPLING

Kenneth A. Levering, North Adams, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jan. 2, 1970, Ser. No. 233
Int. Cl. F16k 17/40
U.S. Cl. 137—68 7 Claims

A fluid coupling which connects parts such as an aircraft fuel cell and hose, and yields in case of a crash to prevent fluid from escaping. The coupling has a pair of poppet valves spring urged toward their closed positions, and held open by a collapsible rod. The coupling has a frangible neck and a stretchable rubber liner the ends of which act as valve seats. Breaking of the frangible neck will cause the rod to release the valves, permitting them to close. In one embodiment,



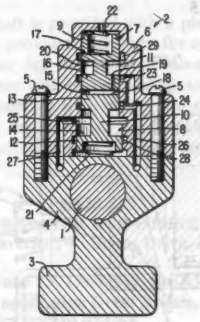
shearpins connect two parts of the coupling so that tensile forces created by a crash will likewise release the valves.

3,630,215

HYDRAULIC GOVERNOR

Masanori Okimoto, Hiroshima-shi, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 28, 1969, Ser. No. 870,029
Claims priority, application Japan, Oct. 30, 1968, 43/95129
Int. Cl. G05d 13/30
U.S. Cl. 137—54 4 Claims



A hydraulic governor having a plurality of valve elements wherein one valve element produces a governor pressure inversely proportional to the centrifugal force operating this valve element, which governor pressure acts on a pressure receiving surface of another valve and the governor pressure generated by the latter valve element is balanced with the centrifugal force operating the latter valve element. This governor eliminates the unstability of control of the line pressure in response to the change of the governor pressure produced by the governor.

3,630,216

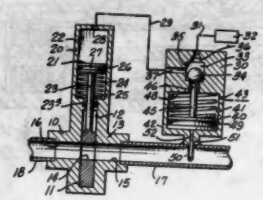
CONDITION-SENSING SAFETY VALVE DEVICES

Warner M. Kelly, Houston, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 8, 1970, Ser. No. 26,628
Int. Cl. F16k 17/00
U.S. Cl. 137—67 10 Claims

An abrasion, corrosion or erosion-sensitive pilot control for a fluid-operated flow-controlling safety valve in a flow line through which abrasive, corrosive or erosive fluids are flowing disposed in said flow line in the path of such fluids for actuating the valve to cut off flow upon the occurrence of a predetermined condition of corrosion, erosion or abrasion

in the flow line to prevent further flow through the flow line. A hollow probe sealing off a closed chamber admits the pressure of the flowing fluids in the flow line to said chamber when its integrity is destroyed to actuate a valve for directing



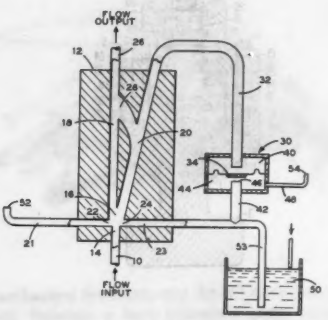
operating fluid from a source of pressure to the valve operator or motor to move the valve to closed position. A pressure-operable valve or a resiliently operable valve may be used for shutting off the flow out through the flow line.

3,630,217

LIQUID ADDITIVE DISPENSER USING A FLUIDIC DEVICE

Edward H. Bell, Clinton, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Apr. 13, 1970, Ser. No. 27,911
Int. Cl. F15c *3/04*
U.S. Cl. 137—81.5 **8 Claims**



A monostable element designed to be vacuum-switched supports interconnecting passages wherein a stream of pressurized fluid can flow through a selectable one of said interconnecting passages, the path of the stream of pressurized fluid being determined by two control passageways for alternately switching the fluid stream from one of the passages to the other, and pressure control means coupled to one of the control passageways to selectively feed a liquid additive through said control passageway to mix with the stream of pressurized fluid.

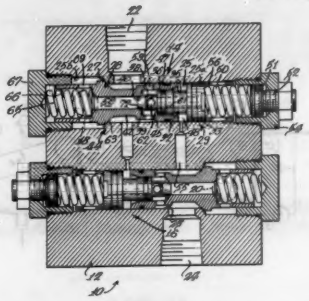
3,630,218

HOLDING VALVE

John T. Parrett, Benton Harbor, Mich., assignor to Koehring Company

Filed Mar. 20, 1970, Ser. No. 21,255
Int. Cl. F16k *17/08*
U.S. Cl. 137—87 **15 Claims**

A counterbalance holding valve assembly for controlling the flow of fluid from a piston and cylinder device and thereby controlling movement of the piston and cylinder device including a first stage counterbalance valve having a low sensitivity for throttling flow in a controlled fashion from the piston and cylinder device and a second stage valve having greater sensitivity than the first stage valve that also functions to control discharge flow from the cylinder device to increase the flow capacity of the counterbalance valve assembly without sacrificing stability and uniform load lower-



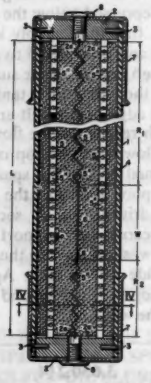
ing, with the first stage valve having a relatively small flow area and the second stage valve having a relatively large flow area with the valves being constructed so that the first stage valve opens at lower control pressures and the second stage valve opens later as the pressure in the piston and cylinder device increases.

3,630,219

HIGH-VOLTAGE FUSE HAVING COMPOSITE FUSIBLE ELEMENT STRUCTURE

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Oct. 20, 1970, Ser. No. 82,330
Int. Cl. H01h *85/04*
U.S. Cl. 337—161 **9 Claims**



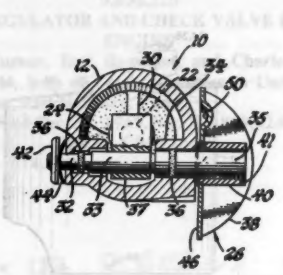
A current-limiting fuse having a composite fusible element structure which includes a wire section for interrupting overload currents, and a ribbon section having series necks for interrupting major fault currents, or short circuit currents. The wire section is straight and is connected in series with the ribbon section and the ribbon section is formed by a strip of zig-zag-shaped relatively hard and resilient silver forming a self-supporting extension spring tending to maintain the wire section under axial stress.

3,630,220

HEAT-SENSITIVE VALVE

Lowell F. Nelson, Muskegon, Mich., assignor to Enterprise Brass Works, Muskegon, Mich.

Filed Feb. 9, 1970, Ser. No. 9,690
Int. Cl. F16k *17/38*
U.S. Cl. 137—77 5 Claims



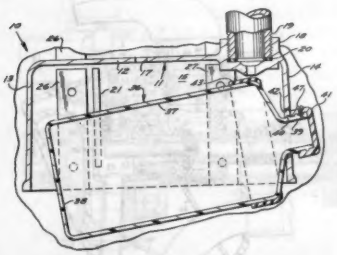
A heat-responsive flow valve including a valve body having coaxial inlet and outlet ports, a stop disc carried by a spring-biased axially oriented plunger, an operator shaft extending across and through the valve body and carrying a cam which depresses the spring-biased plunger when rotated. Rotation of the operator shaft is accomplished by means of a handle which is secured to the shaft by a low-melting point solder bond. The handle may be rotated to a open position and latched in that position by means of a detent mechanism. Should a high-temperature condition exist, the solder bond melts and permits the shaft to rotate independently of the handle thereby closing the valve.

3,630,221

FLOAT-CONTROLLED VALVE ASSEMBLY HAVING BOTTLE-TYPE FLOAT

Robert M. Wilson, Battle Creek, Mich., assignor to Dare Products Incorporated, Battle Creek, Mich.

Filed Oct. 1, 1970, Ser. No. 77,187
Int. Cl. F16k *31/18*
U.S. Cl. 137—448 8 Claims



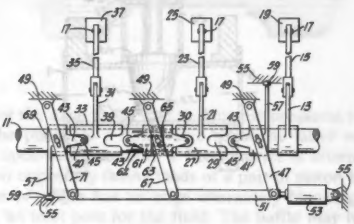
A float valve structure is provided comprising a housing in the form of an inverted tub having a water inlet provided at the top and an aperture at one end. A bottle, preferably tubular, is provided for use as a float, the bottle having a constricted neck extending through the aperture in the end of the housing and having a cap affixed to the end of the mouth of the bottle and engaging the outer surface of the housing, thereby restraining the neck of the bottle within the housing aperture while permitting the bottle to pivot up and down as determined by the water level. A ring of a resilient sealing material, as for example, a rubberband, is annularly mounted at the portion of the bottle which engages the inlet orifice, thereby providing a sealing means. The bottle, when of cylindrical shape, is permitted to engage in rotational movement about its axis, thereby continually renewing the sealing surface of the sealing band and preventing undue wearing in any single area.

3,630,222

APPARATUS FOR SWITCHING FROM LEAN GAS TO RICH GAS BURNING IN A COKE OVEN BATTERY

Linwood G. Tucker, Pittsburgh, Pa., assignor to Koppers Company, Inc.

Filed Mar. 20, 1970, Ser. No. 21,434
Int. Cl. F16k *11/00*; C10f *1/05*
U.S. Cl. 137—309 5 Claims



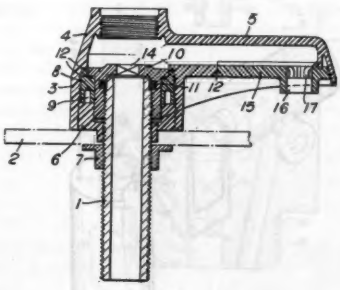
A main drive shaft is provided with a plurality of sleeves, some of which are provided with arms for operating the rods for the lean gas, air lid, and waste heat valves of the coke oven battery. Other sleeves are linked to a fluid-actuated cylinder-piston assembly that moves the other sleeves into coaction with the first sleeves, and thereby interlock them and prevent inadvertent actuation of the valves.

3,630,223

TAPS FOR WATER AND OTHER FLUIDS

Edward Moey Schaverien, 6 Canons Drive, Edgware, Middlesex, England

Filed June 13, 1969, Ser. No. 832,981
Claims priority, application Great Britain, June 28, 1968, 30,974/68
Int. Cl. F16k *27/00*
U.S. Cl. 137—327 5 Claims



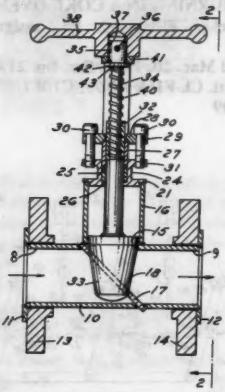
A substantially cylindrical tap body for water and other fluids has an integral sideways-extending spout, and is open at one end to receive a separately formed tap headwork. The opposite end of the chamber, also open for fitting to a supply pipe houses internally a screwed-in component in cooperative engagement with a sleeve internally screw-threaded for screwing on to a supply pipe.

3,630,224

VALVE

Charles F. Kalvelage, 1535 Fairholme Road, Grosse Pointe, Mich.

Filed Oct. 3, 1969, Ser. No. 863,432
Int. Cl. F16k 27/12, 25/00, 1/34
U.S. Cl. 137—375 12 Claims



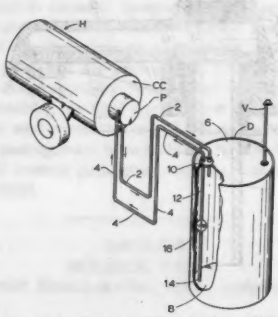
A valve made as a hybrid valve partially from standard shapes of exotic metals which will withstand corrosive chemicals and partially from castings, or as a casting from a corrosion-resistant material, and which includes an elliptical valve hole that forms a valve seat that is contained in a plate that is inclined to the flow of fluid through the valve. The valve further includes a solid tapered or conical plug that closes off flow by entering the elliptical hole, and seating therein, along an axis perpendicular to the axis of fluid flow through the valve.

3,630,225

PORTABLE HEATING SYSTEM AND ACCESSORY FUEL TANK

Paul Chitel, 355 St. Clair Ave. W., Apt. 704, Toronto, Ontario, Canada

Filed Jan. 26, 1970, Ser. No. 5,668
Int. Cl. F23e 15/04
U.S. Cl. 137—565 4 Claims



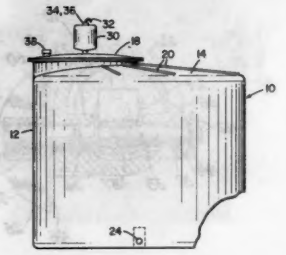
An accessory oil tank for a portable oil heat system having an internal pipe with an external connection through which oil is drawn from the tank by means of a pump; the internal pipe being provided with a check valve which closes to prevent oil flow therethrough when the pump is not drawing oil.

3,630,226

ANAEROBIC STORAGE APPARATUS

Elton R. Develter, Corning, Calif., assignor to Maywood Packing Company, Corning, Calif.

Filed Nov. 21, 1969, Ser. No. 878,695
Int. Cl. B65d 87/02
U.S. Cl. 137—575 13 Claims



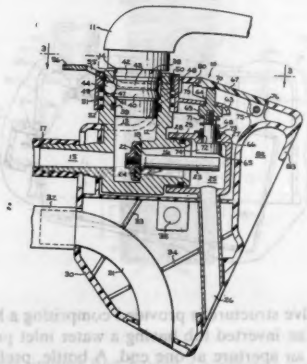
Perishable foods are placed in airtight container that is filled with an edible, biodegradable solution under the exclusion of air for treating, e.g. pickling foods such as vegetables and fruits. Means are provided for withdrawing gases generated in the container from an uppermost, interior point of the container and for replacing the withdrawn volume of gas with additional solution stored in a separate reservoir. Upon termination of the food-treating process the solution is discarded and decomposes under atmospheric conditions, thereby preventing undesirable pollution of the environment. The treated food product is removed from the container and further processed.

3,630,227

ASSEMBLY FOR COUPLING A WASHING MACHINE TO A FAUCET

Marlin L. Race, Elm Groove, Wis., assignor to General Electric Company

Filed Dec. 19, 1969, Ser. No. 886,677
Int. Cl. B05b 1/22
U.S. Cl. 137—583 9 Claims



A coupling assembly is provided for connecting hoses of a washing machine to a water faucet. The assembly is provided with a lever-actuated quick-release connector that joins the assembly to the faucet. A linkage arrangement between the lever of the connector and a normally closed valve within the assembly translates manual actuation of the lever to the valve

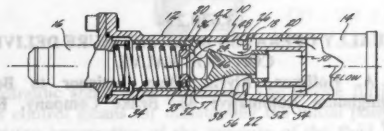
whereby the valve is opened to relieve liquid pressure within the assembly to thereby prevent undesirable splash-out when the assembly is removed from the faucet. The valve within the assembly is also linked to a manually depressible dispensing mechanism whereby water may be selectively dispensed from a discharge passageway out of the assembly when the assembly is operatively engaged to the faucet.

3,630,228

WATER REGULATOR AND CHECK VALVE FOR A JET ENGINE

Albert H. Turner, East Hampton, and Charles R. Kleza, Wethersfield, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 31, 1969, Ser. No. 889,424
Int. Cl. G05d *16/10*
U.S. Cl. 137—614.18 7 Claims



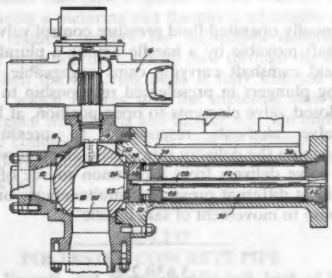
A water regulator and check valve for a jet engine water injection system which is of a simple and uncomplex construction. The water regulator and check valve construction is of an uncomplex construction in that there is substantially one moving part within the regulator.

3,630,229

QUIET FLUID FLOW REGULATOR

Wayn A. Nagel, Alexandria, Va., and William H. Stoddard, North Stonington, Conn., assignors to The United States of America as represented by the Secretary of the Navy

Filed Apr. 9, 1970, Ser. No. 27,013
Int. Cl. F16k *47/02*
U.S. Cl. 137—625.3 12 Claims



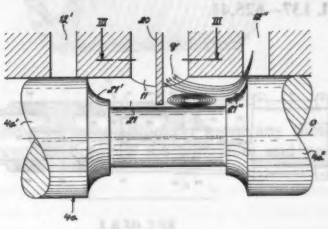
A device for quietly throttling the flow of a fluid stream comprising a plurality of paralleled frictionally resistant tubes inserted into the fluid flow path and ball valve means at one end of the tubes. A pressure equalized, biased seal maintains constant pressure against the ball of the valve means to prevent leakage around the ball. Vibration-absorbing packing surrounds the space between and around the tubes. Each tube is internally rounded at its entry end and flared at its exit end.

3,630,230

FLUID VALVE WITH CONTROLLED AXIAL THRUST

Kurt Stahle, Heimsheim/Leonberg, Germany, assignor to Jos. Schneider & Co., Bad Kreuznach, Germany

Continuation-in-part of application Ser. No. 758,325, Sept. 9, 1968, now Patent No. 3,543,648. This application July 17, 1970, Ser. No. 55,783
Claims priority, application Germany, Oct. 21, 1969, P 19 52 811.1
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.4 7 Claims



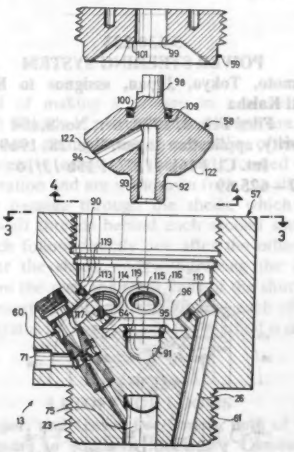
To control the axial thrust due to dynamic pressures reacting upon the piston of a fluid valve when the latter moves toward an open-valve position, a fixed barrier is interposed between two oppositely facing lands of a pair of piston heads at least one of which has an edge alternately blocking and unblocking an inlet port for the fluid. The baffle may be divided into two or more ring segments separated by small gaps from one another and from the piston surface.

3,630,231

MULTIWAY SWITCH VALVE

Franz Georg Miller, Hofingen, Germany, assignor to Techap F. G. Miller Techn.-Chem.-Apparatebau Programmsteuergerate und Anlagen Stellglieder, Hofingen, Germany

Filed Feb. 6, 1970, Ser. No. 9,273
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.16 12 Claims



A multiway switch valve having a housing that includes a chamber and a plurality of channels merging into said chamber and terminating in coupling nipples at the outside of the valve; a channelled valve plug rotatably held in said chamber and adapted to assume a plurality of positions to interconnect selected ones of said channels, said plug has a sealing face in the shape of a spherical section; packing rings

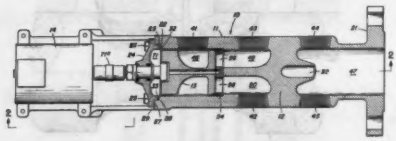
surrounding each channel opening in said chamber to provide a continuous fluidtight seal between said openings and said sealing face.

3,630,232

FLOW DIVERTER

Floyd Hasselriis, Astoria, and William M. Teller, Scarborough, both of N.Y., assignors to American Hydrotherm Corporation

Filed Apr. 2, 1970, Ser. No. 25,038
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.41 10 Claims



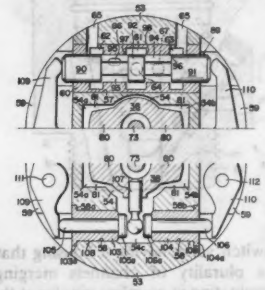
A flow diverter particularly suited for diverting he flow of a heat transfer liquid to be employed in user equipment to either a heater, cooler or neither, to control the temperature thereof, comprising a housing including an intermediate wall or partition dividing the housing into two chambers. The wall is provided with three passages, one connecting the first and second chambers and the remaining two connecting the first chamber to two outlet ports to be connected to heater and cooler inlets, respectively. The first chamber is provided with an inlet port to be connected to the outlet of user equipment and a flow-diverting element for selectively connecting the passages in fluid flow communication with the first chamber. The second chamber is provided with two inlet ports to be connected to heater and cooler outlets, respectively, and an outlet port to be connected to the inlet of user equipment. The flow control element is constructed so as to balance the pressure forces on the top and bottom thereof thereby essentially eliminating the frictional forces which resist movement of the flow diverting element.

3,630,233

POWER STEERING SYSTEM

Koji Miyamoto, Tokyo, Japan, assignor to Kayabakogyo Kabushiki Kaisha

Filed Feb. 4, 1970, Ser. No. 8,484
Claims priority, application Japan, Dec. 28, 1969, 44/123690
Int. Cl. F16k *11/07*; F15b *13/16*
U.S. Cl. 137—625.69 6 Claims



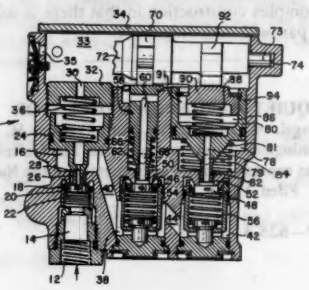
A power steering system has a power cylinder assembly for turning the steering road wheels of a vehicle and a valve mechanism which is actuated in response to the steering action. The valve mechanism comprises a valve housing coupled to the power cylinder assembly, a valve spool fitted into the valve housing, a pair of head levers pivotably fixed on both sides of the valve spool in such a manner that the one ends of said pair of head levers may firmly press against both ends of the valve spool respectively, and lever rods slidably fitted into the valve housing in such a manner that free ends of the lever rods may firmly press against the other ends of the pair of head levers. The lever rods are coupled to a guide pin extending from an input shaft which in turn is coupled to the steering wheel, and the input shaft is coupled through a torsion bar to the valve housing so that in response to the relative angular displacement between the input shaft and the valve housing upon steering, the valve spool is shifted through the guide pin, the lever rods and the pair of head levers, whereby the working liquid under pressure is selectively forced into one of the right and left pressure chambers in the power cylinder assembly, thereby turning the steering road wheels.

3,630,234

MANUALLY OPERATED DUAL PRESSURE DELIVERY CONTROL VALVE

David A. Hoffman, Elyria, Ohio, assignor to Bendix-Westinghouse Automative Air Brake Company, Elyria, Ohio

Filed Jan. 9, 1970, Ser. No. 1,754
Int. Cl. G05d *16/10*; F16k *11/14*
U.S. Cl. 137—630.2 1 Claim



A manually operated fluid pressure control valve including a camshaft movable by a handle among a plurality of positions, said camshaft carrying cams engageable with valve-operating plungers in preselected relationship to move normally closed valve elements to open position, at least one of said valve elements responding to pressure-reducing mechanism on the delivery side of said element whereby said control valve delivers from a common source of fluid pressure fluid at different pressures simultaneously or separately in response to movement of said handle.

3,630,235

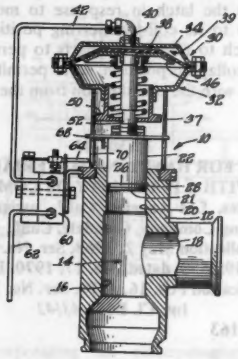
HYDRAULIC SHOCK DAMPENER

Bruce A. Wiley, Carpentersville; Chester J. Witt, Deerfield, and Sigmund P. Skoli, Elmwood Park, all of Ill., assignors to Mojonnier Bros. Co., Chicago, Ill.

Filed Oct. 30, 1969, Ser. No. 872,632
Int. Cl. F16l *55/04*
U.S. Cl. 138—31 2 Claims

A hydraulic shock dampening device for use in fluid lines where changes in direction of the fluid flow are to be induced. The device includes a body member having a fluid passage therein defined by intersecting inlet and outlet branches, and a retractable piston member disposed proxi-

mate the intersection of said branches and coaxial with the inlet branch such that fluid entering the body will impinge initially upon said piston with said piston retracting to absorb



the hydraulic shock thus produced. The device further includes control means for maintaining the initial position of said piston irrespective of the pressure of the fluid in said line.

3,630,236

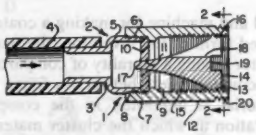
CONTINUOUS MINI-FLOW IRRIGATION DEVICE

Richard E. Diggs, 210 North River St. P.O. Box 588, Carthage, Mo.

Filed June 29, 1970, Ser. No. 50,806

Int. Cl. F15d *1/02*

U.S. Cl. 138—45 **11 Claims**



A continuous mini-flow irrigation device wherein a metering cone having a metering slot therein is adjustably inserted through a resilient washer for adjustably metering flow through the irrigation device. Full flow through the device is achieved when the metering cone is fully inserted through the washer, which insures that the metering slot will not become plugged with debris and further wherein under varying pressure conditions the washer will be deformed into the metering slot to maintain a uniform continuous flow from the irrigation device.

3,630,237

POLYESTER CONCRETE PIPE

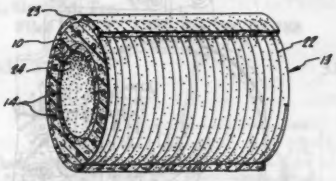
William R. Varnell, and Mance R. Mitchell, both of San Antonio, Tex., assignors to Concrete Development Corporation, San Antonio, Tex.

Original application Nov. 13, 1967, Ser. No. 685,239, now Patent No. 3,506,752, which is a continuation-in-part of Ser. No. 366,332, May 11, 1964, abandoned, Ser. No. 429,516, Feb. 1, 1965, abandoned, and Ser. No. 659,830, July 6, 1967, abandoned. Divided and this application Feb. 9, 1970, Ser. No. 9,693

Int. Cl. F16l *9/08*

U.S. Cl. 138—176 **2 Claims**

Concrete pipe is made from a mixture of polyester resin and aggregate, and may be wrapped with resin coated aluminum reinforcing wire in tension to increase the internal pressure which the pipe can withstand. The pipe may also be reinforced with longitudinally placed resin coated aluminum bars. Both the reinforcing wire and bars are coated with resin



while at an elevated temperature to avoid any substantial detrimental reaction between the aluminum and polyester resin.

3,630,238

METHOD AND APPARATUS OF MAKING A SELVAGE IN A LOOM

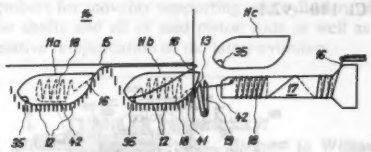
Edgar H. Strauss, Ruti/ZH, Switzerland, assignor to Ruti Machinery Works, Ltd., formerly Caspar Honegger, Zurich, Switzerland

Filed Feb. 9, 1970, Ser. No. 9,739

Claims priority, application Switzerland, Feb. 20, 1969, 2573/69

Int. Cl. D03d *47/26*

U.S. Cl. 139—12 **9 Claims**



A method of making a selvage in a wave-type loom, wherein weft threads of predetermined length are passed, always in the same arrangement, to a plurality of shuttles prior to their successive entry into the sheds formed during the weaving operation and are withdrawn from the shuttles again during their passage through the sheds, which comprises cutting the weft threads behind each second shuttle of the shuttles which follow directly one after the other when the shuttles enter the sheds, and withdrawing the threads alternately from the rear and front ends of the shuttles for the purpose of inserting the weft threads into each of the sheds. Also an apparatus for carrying out this method is disclosed.

3,630,239

LETOFF FOR LOOMS

Felix E. Hooper, and Carlos Lee Owens, both of Greenville, S.C., assignors to Southern Machinery Company, Greer, S.C.

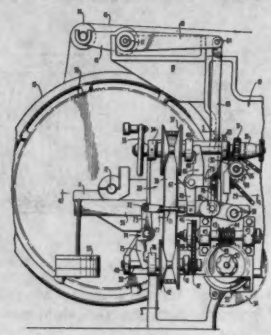
Filed Jan. 26, 1970, Ser. No. 5,720

Int. Cl. D03d *49/06*

U.S. Cl. 139—110 **3 Claims**

A constant warp tension letoff features an improved power path between the input shaft and letoff shaft which allows a considerable lessening of the force and tension which the transmission belt must exert on the variable cone pulleys of the letoff. A double-lead worm and gear at the letoff shaft reduces the torque which must be transmitted through the

belt and cone pulley transmission. An improved weight lever mounting eliminates twisting of the weight lever which tends



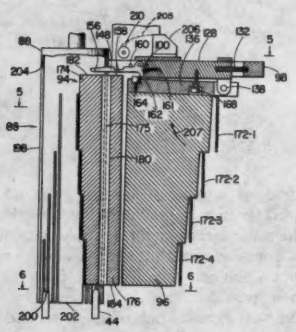
to cause binding. Excessive meshing of the lower worm and gear caused by heavy belt tension is eliminated.

3,630,240

WINDING AND TRANSFER APPARATUS FOR DYNAMOELECTRIC MACHINE STATOR COILS

Robert J. Eminger, and Buddy S. Stuckey, both of Ft. Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Sept. 18, 1969, Ser. No. 859,148
Int. Cl. B21f *3/02*; H02k *15/04*
U.S. Cl. 140—92.1 **23 Claims**



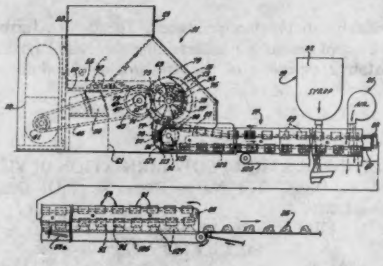
Apparatus for winding stator coils and for transferring the wound coils to a transfer device which includes a plurality of spaced, parallel, elongated blade elements defining slots therebetween, at least two of the slots respectively receiving the opposite sides of a coil. A coil form assembly is provided having first and second parts adapted to have a coil wound thereon. The coil form parts are mounted for relative movement between an expanded winding position, and a collapsed coil-transferring position. One of the parts has side portions for respectively forming the opposite sides of a coil wound thereon which are received in the transfer device slots, the side portions having recesses therein for removably receiving two of the blade elements with the opposite sides of the coil being received in the respective slots defined by the two blade elements and by respectively adjacent blade elements. The coil form parts are spring biased toward their collapsed position, and a latch is provided for holding the parts in their expanded position. The transfer device is arranged for movement between an inactive position in which it is removed from the form, and a coil-transferring position in which at least two of the blade elements are received within the recesses in the one coil form part. A part on the transfer device engages the latch in response to movement of the transfer device to its coil-transferring position, thereby actuating the latch to release the parts to permit their movement to their collapsed position, so to permit removal of the transfer device with the coil thereon from the coil form.

3,630,241

APPARATUS FOR HANDLING MATERIAL INCLUDING A ROTOR WITH A PLURALITY OF COMPARTMENTS

Robert F. Jones, Los Angeles, Calif., assignor to Hoffman Manufacturing Company, Glendale, Calif.

Original application May 2, 1968, Ser. No. 726,153, now Patent No. 3,495,550, dated Feb. 17, 1970. Divided and this application Feb. 16, 1970, Ser. No. 11,657
Int. Cl. B65b *43/42*
U.S. Cl. 141—163 **4 Claims**



A method and machine for making a coated candy cluster. In a preferred form of the invention, the machine includes a rotatable rotor having a plurality of compartments. The rotor rotates the compartments between a filling station in which cluster material is deposited in the compartments and a discharge station at which the cluster material is discharged from the rotor onto a conveyor. Metering means responsive to rotation of the rotor control the amount of cluster material deposited in each of the compartments. The conveyor conveys the discharge cluster material to an enrober which coats the cluster material with chocolate or other suitable coating material.

3,630,242

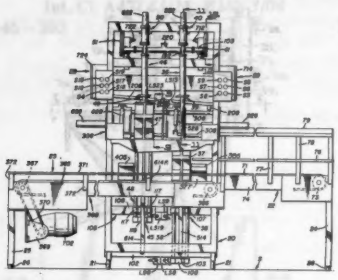
APPARATUS FOR AUTOMATIC FILLING OF LIQUID CONTAINERS HAVING SEMIRIGID WALLS

Warren J. Schieser, Columbus, and John P. Conners, Lancaster, both of Ohio, assignors to Corco Inc., Columbus, Ohio

Original application Apr. 1, 1968, Ser. No. 717,704, now Patent No. 3,529,399, dated Sept. 22, 1970. Divided and this application Mar. 18, 1970, Ser. No. 20,782
Int. Cl. B65b *1/30*; B67c *3/02*
U.S. Cl. 141—95 **29 Claims**

This container-filling apparatus fills containers in an automatically controlled, sequential operation which assures positive control over filling of the containers with a desired volumetric quantity of the liquid. Each container is supported during the filling operation for proper orientation of the fill opening and for support of the container's sidewalls. Filling is accomplished by insertion of a liquid-dispensing nozzle through the fill opening at the initiation of a fill operation and subsequent relative separating movement of the container and nozzle at a rate which maintains the discharge orifice of the dispensing nozzle immersed in the liquid to

prevent foaming of the liquid. The container is filled in accordance with volumetric capacity limits with the volume of liquid dispensed into each container being determined by a



flowmeter incorporating an electromagnetic transducer thereby minimizing the possibility of liquid contamination through avoidance of direct physical contact between the liquid and external indicating components of the flowmeter.

3,630,243

TREE-BUNCHING MECHANISM AND TREE-SKIDDER VEHICLE INCORPORATING THE SAME

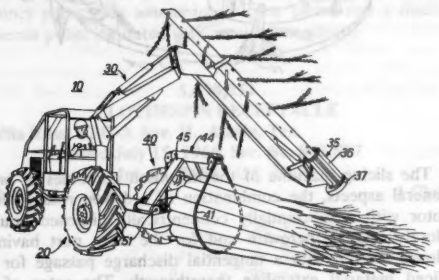
Douglas D. Hamilton, Mount Royal, Quebec, and Domenico Benedetto, Montreal, Quebec, both of Canada, assignors to Paper Company, Montreal, Quebec; Quebec North Shore Paper Company, Montreal, Quebec and Abitibi St. Anne Paper Ltd.,, Beaupre, Quebec, Canada, part interest to each

Filed Oct. 23, 1969, Ser. No. 868,725

Claims priority, application Canada, Oct. 23, 1968, 033,299

Int. Cl. A01g *23/02*

U.S. Cl. 144—3 D **16 Claims**



A tree-handling vehicle including a knuckle boom pivotally mounted on an articulated vehicle for slewing about a vertical axis and incorporating a felling head on the free end of the boom comprising the combination of a grapple and a shear rigidly secured to a common frame pivotally attached to the boom. A log-handling unit or tree-bunching mechanism, as it may also be referred to, is mounted on the trailing chassis of the articulated vehicle and includes a pair of L-shaped arms at least one of which is pivotally attached to the vehicle and having a flexible cable detachably secured to one arm and the other is attached to a drum of a winch mounted on the vehicle. The cable passes over self-aligning sheaves pivotally mounted on the other of the two arms. The arms are movable relative to one another to open and close the noose and the size of such noose is varied by winding in or paying out the cable.

3,630,244

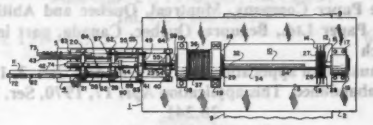
SAW APPARATUS WITH LATERALLY ADJUSTABLE SAWS

Jeff Y. Cromeens, Mesquite, and Thomas E. Clyce, Garland, both of Tex., assignors to Industrial Woodworking Machine Co., Inc., Garland, Tex.

Filed Mar. 27, 1970, Ser. No. 24,788

Int. Cl. B27b *5/34*

U.S. Cl. 143—37 B **33 Claims**



A saw apparatus having an arbor assembly and coacting actuating means, the assembly comprising a plurality of saws secured to the adjacent ends of telescopic shafts of progressively inward increasing length supported by and having slidable connection with a longer rotatable axle by common driving means. Preferably, the slidable connection includes coacting keys and keyways extending longitudinally of the drive means, shafts and axle with adjacent keyways being relatively staggered and spaced progressively outward toward the saws. The actuating means may include pressure fluid cylinders, having piston rods projecting toward the saws and attached to the opposite adjacent ends of the saw shafts with the cylinders and rods of the longer shafts being movable with the reciprocation of the rods and cylinders of the intermediate shafts and the piston rod of the shortest shaft, and thrust members for movably supporting said cylinders of said longer saw shafts and all of said piston rods as well as permitting relative reciprocation of the latter cylinders.

3,630,245

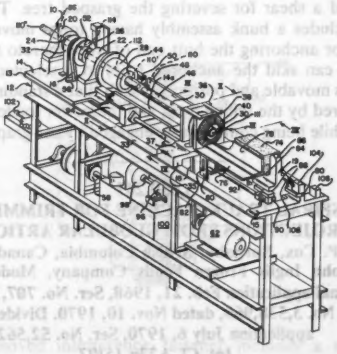
TUBULAR POWER SAW

Robert J. Monahan, Sewickley, Pa., assignor to William A. Bayer, Pittsburgh, Pa.

Filed Feb. 13, 1970, Ser. No. 11,352

Int. Cl. B27b *5/12, 33/18*

U.S. Cl. 143—85 **12 Claims**



I disclose a cutting apparatus the combination comprising a base, an elongated tubular inner cutter, extending parallel to the base and rotatably supported in cantilever fashion from said base, a tubular outer cutter rotatably mounted on the base and substantially concentrically of said inner cutter but spaced longitudinally from the point of cantilever support

of said inner cutter, means for rotating said cutters, and means for feeding an elongated workpiece from which a tubuliform member is to be cut to said inner and outer cutters, said longitudinal spacing approximating the anticipated length of said workpiece.

3,630,246

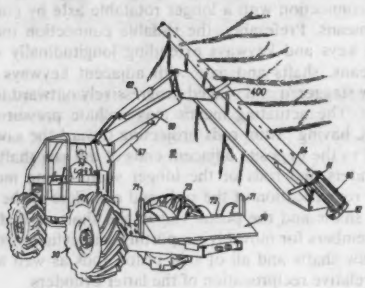
MODIFIED SKIDDER AND FELLING HEAD

Douglas D. Hamilton, Mount Royal, Canada, assignor to Canadian International Paper Company; Quebec North Shore Paper Company, Montreal, Quebec and Abitibi St. Anne Paper Ltd., Beaupre, Quebec, Canada, part interest to each

Continuation of application Ser. No. 695,453, Jan. 3, 1968, now abandoned. This application Apr. 17, 1970, Ser. No. 28,241

Int. Cl. A01g *23/02*

U.S. Cl. 144—3 D **8 Claims**



A vehicle for use, in field logging operations, which includes a self-propelled tractor unit having an extendible and retractable boom pivotally mounted for slewing about a vertical axis and including a felling head mounted on the boom, such felling head including a grapple for grasping a standing tree and a shear for severing the grasped tree. The vehicle also includes a bunk assembly having tongs movable selectively for anchoring the butt end of trees thereto so that the vehicle can skid the anchored trees to a selected site. The boom is movable and positioned such that a standing tree can be severed by the felling head and thereafter loaded onto the bunk while being continuously engaged by the grapple.

3,630,247

SPIRAL TRACK MACHINE FOR TRIMMING PROJECTIONS FROM GLOBULAR ARTICLES

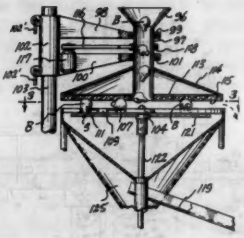
James P. Cox, Burnaby, British Columbia, Canada, assignor to John Inglis Frozen Foods Company, Modesto, Calif.

Original application Feb. 21, 1968, Ser. No. 707,152, now Patent No. 3,538,969, dated Nov. 10, 1970. Divided and this application July 6, 1970, Ser. No. 52,562

Int. Cl. A23n *15/02*

U.S. Cl. 146—81 **2 Claims**

By engagement of pad means with the upper side of a globular article, it is rolled along guideways in a compound rotation, which periodically moves a projection of the article through the slot of the guideways. Such compound rotation is effected by forming the guideways as generally parallel curved convolutions forming a spiral path and moving pad means above such guideways in a direction generally lengthwise of the slot. The pad means is a circular pad which rotates above the spiral guideways. Knife blades are rotated



closely beneath the guideways to sever projections of articles extending through the slot of the guideways.

3,630,248

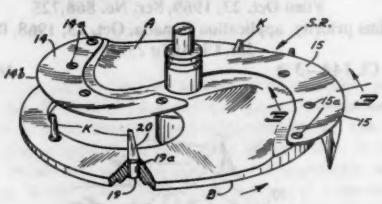
SLICING MACHINE FOR DIVERSELY CUTTING VEGETABLES AND THE LIKE

Maynard P. Hanson, 2511 McKinley St., N.E., Minneapolis, Minn.

Filed Apr. 3, 1970, Ser. No. 25,337

Int. Cl. B26d *4/28*

U.S. Cl. 146—124 **7 Claims**



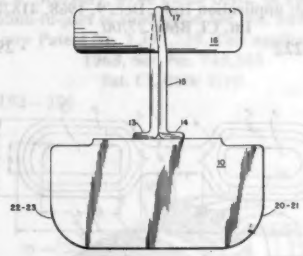
The slicing machine of the invention combines in broad general aspects, the combination of a driven rotary slicing rotor with a substantially concentrically disposed housing closely related therewith and for the most part having a closed bottom with a tangential discharge passage for the sliced material extending therethrough. The rotor of the machine has a body constituting two or more spiraled volutes having peripheral edges which extend concentrically of the housing. At the separated edges of the volutes from the body, spiraled, curvilinear knife-edge cutting elements are removably attached extending from points close to the axis or hub of the device outwardly to the peripheral edge of each volute and spaced some distance above the adjacent edge of the other volute. A plurality and variety of arrangements of upwardly extending vertical cutting knives are supported from and mounted upon a plurality of volutes extending above the tops thereof and in predetermined spiral arrangements relative to the first-mentioned cutting edges, to produce simultaneous vertical cutting along predetermined lines and radial distances from the axis of the rotor. Depending upon the arrangement and structure of the cutting knives, as illustrated, elongate shredded or string material may be produced in the slicing operation, or in the alternative, production of diced, rectangular wedges, or cubical granular particles may be attained.

3,630,249

CHOPPER CONSTRUCTION

Elizabeth C. Brunwin, At Water Branch, 3517 Dover St., Los Angeles, Calif.

Filed Feb. 20, 1970, Ser. No. 13,065
Int. Cl. A47j *43/28*; B26b *3/04*
U.S. Cl. 146—203 2 Claims



A twin blade chopper formed from a single piece of sheet metal with a handle and a shank, said shank being looped or reeved diametrically in a groove in the handle. The shank flows back from the diametrical groove in contiguous relation to spotwelds on a bright or saddle of the twin chopper blades. The outboard sides of the blades are chamfered to provide cutting edges and the ends of the chopper blades are open and rounded to permit the chopper to rock, if desired.

3,630,250

AMMONIUM NITRATE EXPLOSIVE COMPOSITION

Joseph R. Hradel, Mount Pleasant, Mich., and Harold E. Staadt, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Original application Jan. 5, 1959, Ser. No. 784,881. Divided and this application Apr. 21, 1969, Ser. No. 818,087
Int. Cl. C06b *1/04*
U.S. Cl. 149—21 13 Claims

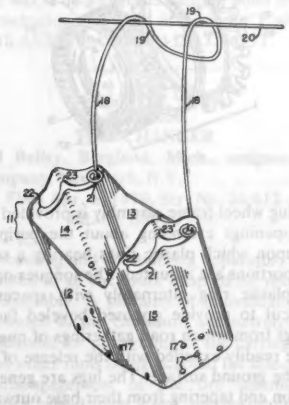
An explosive composition is provided which contains a distinct particulate ammonium nitrate phase and a distinct aqueous phase saturated with ammonium nitrate.

3,630,251

CLOTHESPIN RECEPTACLE

Mallia Ross, 4207-A Ave. H., Austin, Tex.

Filed July 15, 1969, Ser. No. 841,887
Int. Cl. B65d *1/38*, *25/32*
U.S. Cl. 150—1.8 1 Claim



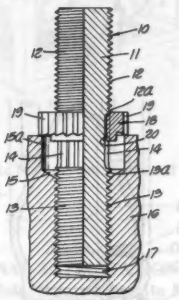
A wipe-clean plastic clothespin receptacle adapted to contain both clothespins and small articles of clothing, and provided with an adjustable tilt support handle adapted to hook over and slide along the user's clothesline.

3,630,252

STUD FASTENER ASSEMBLY WITH INTEGRAL LOCKRING

Jose Rosan, Sr., San Juan Capistrano, and Jose Rosan, Jr., Newport Beach, both of Calif., assignors to Rosan Engineering Corp., Newport, Calif., by said Jose Rosan, Jr.

Filed Apr. 27, 1970, Ser. No. 32,081
Int. Cl. F16b *39/02*
U.S. Cl. 151—41.73 6 Claims



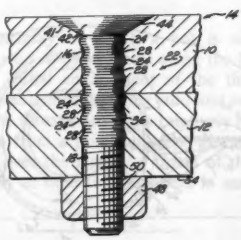
A stud fastener assembly having both ends thereof threaded and a lockring in slidable but captive engagement between the said threaded ends so that said lockring is not disengageable therefrom and a method of making the same whereby the lockring is slipped onto the stud fastener subsequent to threading one end thereof and thereafter threading the opposite end of said fastener.

3,630,253

INTERFERENCE FASTENER

Russell G. Sherman, Santa Monica, Calif., assignor to The Lamson & Sessions Company, Cleveland, Ohio

Filed Oct. 22, 1969, Ser. No. 868,429
Int. Cl. F16b *39/00*
U.S. Cl. 151—41.73 1 Claim



An improved interference fastener includes a metallic shank having waves for interfering with the inner surfaces of holes formed in metallic members to be interconnected by the fastener. The waves have an amplitude of between 0.001 and 0.004 of an inch and include a series of protuberances or crests which interfere with the metallic members. This interference improves fatigue life by prestressing the members around the holes to thereby reduce the variation in stress or load span to which this area is effectively subjected when a varying or alternating load is applied in the members. In ad-

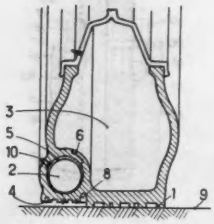
dition, the interference retards relative movement between the fastener and the members. The waves also provide a series of circular recesses or troughs having bottom or innermost portions which are spaced from the members to reduce metal-to-metal contact between the fastener and the members.

3,630,254

DUAL-PURPOSE TIRE FOR DRY OR ICY ROADS

Ludwig Stadelmann, Schopperstrasse 14, Altdorf, Nuremberg, Germany

Filed Nov. 18, 1969, Ser. No. 877,692
Claims priority, application Germany, Nov. 30, 1968, P 18 09 842.5
Int. Cl. B60c *11/00*
U.S. Cl. 152—209 **5 Claims**



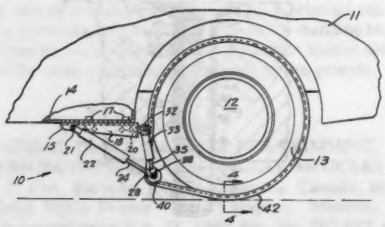
The invention concerns a dual-purpose tire which can be used on both dry and snow-covered or icy roads, being made up of a monobloc casing comprising, in addition to its main tube, a second, smaller tube having a tread with points, these two tubes being inflated separately, so that the tread with points can by selection by brought level with or set back from the tread of the main tube.

3,630,255

TRACTION BELT ASSEMBLY

Carl P. Wonderley, Box 112, Grottoes, Va.

Filed Jan. 6, 1970, Ser. No. 943
Int. Cl. B60c *27/10*
U.S. Cl. 152—215 **4 Claims**



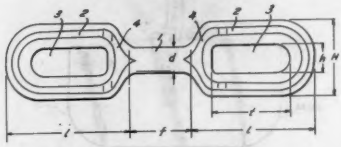
A traction belt assembly for motor vehicles useful for increasing the traction of the motor vehicle in mud, snow and icing conditions. The traction belt encompasses the tire and has a tension roller engaged therewith to maintain a constant tension on the belt. The roller is supported by spring-biased arms to permit it to float while tensioning the belt. The belt is provided with flanges along its opposite side edges to maintain its contact with the tire and is optionally provided with carbide studs for increased traction.

3,630,256

PROTECTIVE MESH

Walter Siepmann; Walter Siepmann, Jr., both of Haus Mohnetal; Hans-Juergen Vogt, Kulbe, and Herbert Sobota, Unterm Hagen, all of Germany, assignors to Siepmann-Werke KG, Belecke am Moehne, Germany

Continuation-in-part of application Ser. No. 786,931, Dec. 26, 1968. This application Jan. 10, 1969, Ser. No. 790,226
Claims priority, application Germany, June 25, 1968, P 17 55 805.3: application Italy, Dec. 9, 1968, 41820 A/68
Int. Cl. B60c *27/00*
U.S. Cl. 152—222 **29 Claims**



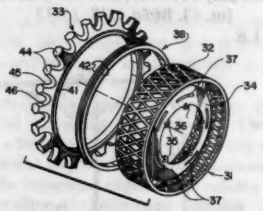
A protective mesh for vehicle tires and the like consists of a plurality of one-piece members each of which has at least two closed loop portions and a connecting portion connecting the same. Each loop portion has an opening so dimensioned as to permit sliding insertion of a loop portion of an other member only when the loop portions of the respective members have a predetermined orientation with reference to one another. Each loop portion has two integral sections one of which is closer to and the other of which is farther from the associated connecting portion and the general planes of at least the aforementioned other sections are located in at least substantial parallelism with one another. Each connecting portion of each of the members extends through and is at least in part slidably accommodated in a loop portion of at least one other of the plurality of members so that all of the members are connected movable with reference to each other and constitute a protective mesh.

3,630,257

WHEEL FRAME WITH MOLDED PLASTIC TONGUES

Nandor Goldberger, 37-15 Parsons Blvd., Flushing, N.Y.

Filed Sept. 15, 1970, Ser. No. 72,346
Int. Cl. B60c *11/06*
U.S. Cl. 152—301 **6 Claims**



A finned lug wheel frame assembly is provided wherein the frame has openings extending about the periphery of the same, and upon which plastic rings bearing a series of tongues or lug portions are mounted. The tongues or lugs extend about the plastic ring alternately with spaces and these spaces are cut to provide opposed beveled faces and fins upon the lugs from which road gatherings of mud, water and snow can be readily expelled with the release of the lug portions from the ground surface. The lugs are generally of hexagonal section and tapering from their base outwardly and inwardly to their outer end leaving a flat hexagonal shape road contact face. The rows of lugs and their integral rings are laterally spaced upon the rim so as to provide openings

through which road gatherings may be passed into the rim upon engagement with the road surface and outwardly of the rim by centrifugal action so as to keep the tire and rim free of such road gatherings.

3,630,258

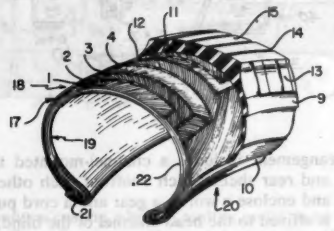
TIRE HAVING PLIES MADE OF FIBERGLASS AND NYLON

Lawrence R. Sperberg, 6740 Fiesta Drive, El Paso, Tex.

Continuation-in-part of application Ser. No. 504,768, Oct. 24, 1965, now Patent No. 3,397,729. This application July 9, 1968, Ser. No. 743,345

Int. Cl. B60c *9/10*

U.S. Cl. 152—356 **3 Claims**



A bias-constructed tire having a carcass built of several plies with the innermost ply being made of fiberglass tire cord material and the outermost ply being made of polyamide tire cord material as the principal reinforcing fiber.

3,630,259

SYNTHETIC YARN COATED WITH A SPIN FINISH AND PROCESS FOR PRODUCING THE SAME

Edmond P. Brignac, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 838,001, June 16, 1969, now abandoned , Continuation of application Ser. No. 523,970, Feb. 1, 1966, now abandoned , which is a continuation-in-part of application Ser. No. 332,837, Dec. 23, 1963, now abandoned. This application Nov. 24, 1969, Ser. No. 879,560

Int. Cl. B60c *9/00*

U.S. Cl. 152—359 **9 Claims**

Spin finish for yarns to be bonded to rubber includes polyvinyl alcohol and microcrystalline or emulsifiable polyethylene wax. The wax has a melting point of at least 50° C. and a penetration at 77° F. of between 1 and 10 in accordance with ASTM test method D-1321-55T.

3,630,260

TIRE CHANGER

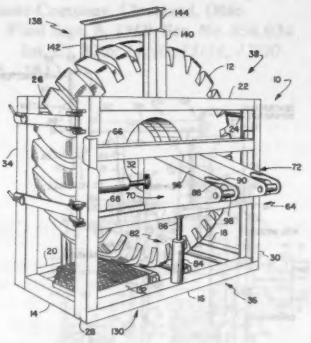
Carl Harold Bailey, Bergland, Mich., assignor to Copper Range Company, New York, N.Y.

Filed Apr. 8, 1970, Ser. No. 26,612

Int. Cl. B60c *25/06*

U.S. Cl. 157—1.26 **9 Claims**

In a tire mounting and demounting apparatus, a carriage is slidably mounted to an enclosure adapted for reception of an upright tire assembly. A plurality of individually actuatable rams are mounted to the enclosure and carriage, particular rams being adapted for positioning of the carriage within the enclosure and other rams being adapted for selective engagement and disengagement of the tire assembly. In the demounting of a wheel from a tire, the positioning rams are actuated individually until the engagement rams and the wheel is in spaced relation. Thereafter, the engagement rams are actuated selectively for engagement and disengagement with the wheel, in consequence the adhesive bond between



the wheel and tire is broken and removal of the wheel from the tire is facilitated.

3,630,261

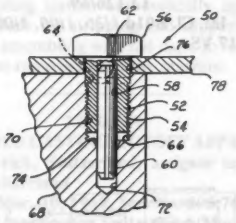
FRICTIONAL ANTIROTATION DEVICE

Paul R. Gley, Hillsdale, N.J., assignor to Rex Chainbelt Inc., Milwaukee, Wis.

Continuation of application Ser. No. 708,565, Feb. 27, 1968, now abandoned. This application Dec. 11, 1969, Ser. No. 880,504

Int. Cl. F16b *39/00*

U.S. Cl. 151—70 **23 Claims**



A fastener assembly in which a nut is adapted to be threaded onto a stud so as to travel along the length thereof from a point of initial engagement of the threads and in which interengageable means on the stud and on the nut and independent of the threads provide a relatively high frictional antirotation force from a point adjacent the point of initial engagement and over the length of travel of the nut on the stud, thus securely to hold two members in assembled relationship.

3,630,262

METHOD AND APPARATUS FOR PRODUCING AN IMPROVED ANHYDROUS CAUSTIC PRODUCT

Stanley J. Macek, South Holland, Ill., assignor to Whiting Corporation

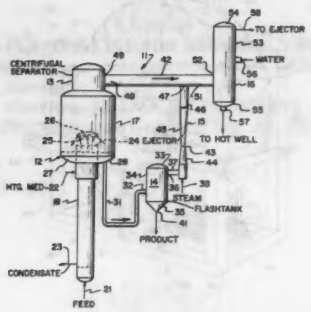
Filed July 22, 1969, Ser. No. 843,676

Int. Cl. B01d *1/28*; **F26b** *7/00*; **B01d** *1/00, 1/16*

U.S. Cl. 159—2 **7 Claims**

An improved dehydration method and apparatus for producing an anhydrous caustic product having a water content of 0.5 percent by weight or less. Caustic feed is heated

to a temperature from about 600° to 700° F. and the water content removed therefrom in a two-stage vaporization process wherein the first stage is conducted in an evaporating



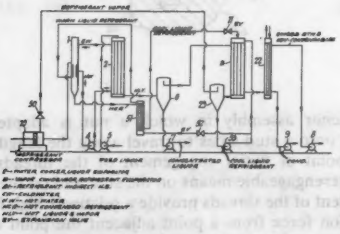
chamber maintained at an absolute pressure of from 2 to 20 inches of mercury and the second stage is conducted in a flash tank maintained at an absolute pressure of below 5 inches of mercury, and preferably below 2 inches of mercury.

3,630,263

EVAPORATION OF LIQUOR

John Moseley Davies, Amersham, England, assignor to Parkson Industrial Equipment Company Limited, Dartford, Kent, England

Filed Mar. 10, 1970, Ser. No. 18,140
Claims priority, application Great Britain, Mar. 12, 1969, 13,126/69
Int. Cl. B01d *1/26, 1/00, 3/00*
U.S. Cl. 159—17 VS **7 Claims**



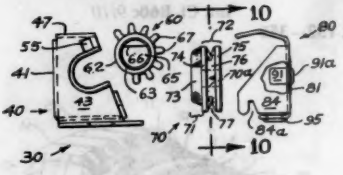
Liquid water, is directly heated in a first heat exchanger by a hot immiscible H.E. fluid and the heated water is then passed to a second heat-exchanger where it indirectly heats a liquor to be evaporated. Vapor separated from the liquor passes to a third heat-exchanger and there in condensing evaporates at least some of a refrigerant which is the immiscible fluid. The refrigerant vapor is compressed and supplied to one or both of the first and second heat exchangers where it directly contacts said liquid water and is condensed, after which the condensed refrigerant is returned to the third heat exchanger partially evaporated there and the released vapor returned to the compressor. The refrigerant may be in an emulsion of refrigerant in water.

3,630,264

VENETIAN BLIND TILTING APPARATUS

Victor Debs, Staten Island, N.Y.; James J. Kapeller, Jr., East Rutherford; George Neira, Teaneck, and Leo Abate, Wayne, all of N.J., assignors to Levolor Lorentzen, Inc., Hoboken, N.J.

Filed Nov. 24, 1969, Ser. No. 879,204
Int. Cl. E06b *9/304, 9/26*
U.S. Cl. 160—177 **16 Claims**



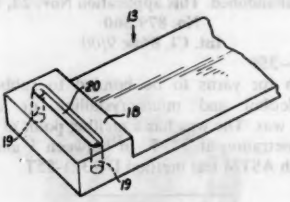
The arrangement includes a channel-mounted tilter that has front and rear shells which confront each other mouth-to-mouth and enclose a worm, a gear and a cord pulley. The rear shell is affixed to the head channel of the blind, with the expanse of the mouth of the shell extending lengthwise of the head channel. The front shell is readily attachable to and detachable from the rear shell.

3,630,265

UPHOLSTERY SUPPORTS

Raymond Biggs, Middleton Junction, Manchester, England, assignor to Vitafoam Limited

Filed Sept. 2, 1969, Ser. No. 854,383
Claims priority, application Great Britain, Jan. 1, 1969, 131/69
Int. Cl. A47h *3/00*
U.S. Cl. 160—382 **3 Claims**



The invention is concerned with upholstery supports such as webbing straps or platformlike supports; more particularly with the provision of providing improved attachment locations in such supports. The upholstery support according to the invention is moulded from suitable material such as rubber and incorporates attachment locations each being in the form of a thickened portion having one or more holes to accommodate part of an attachment means such as a hook, and these being a recess in the thickened portion in the region of the hole or holes in which part of the attachment means will lie so that, in use, loading on the support is distributed across a substantial part of the thickened portion. The invention is also directed to a method of producing such a support by a moulding technique in an appropriately formed mould.

3,630,266

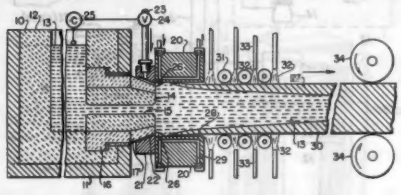
CONTINUOUS CASTING PROCESS

Leonard Watts, Cedarhurst, N.Y., assignor to Technicon Corporation, Tarrytown, N.Y.

Continuation of application Ser. No. 628,348, Apr. 4, 1967, now abandoned. This application Nov. 21, 1969, Ser. No. 878,956

Int. Cl. B22d 11/10

U.S. Cl. 164—73 7 Claims



In continuous casting wherein molten metal to be continuously cast flows from a casting nozzle into a cooled mold from which a billet with at least an outer shell solidified is withdrawn, a gas is injected under pressure about the casting nozzle into the mold to form a gas pocket about the casting nozzle in molten metal within the mold, the gas escaping between the forming billet and the mold.

3,630,267

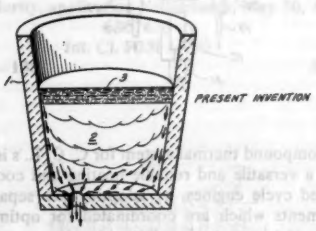
METHOD OF CONTROLLING THE TEMPERATURE OF MOLTEN FERROUS METAL

Joseph W. Hlinka; Andrew P. Smith, both of Bethlehem, and Andrew J. Slabikosky, Allentown, all of Pa., assignors to Bethlehem Steel Corporation

Filed May 18, 1970, Ser. No. 40,468

Int. Cl. B22d 11/10; C21c 7/00

U.S. Cl. 164—82 7 Claims



A method of controlling the temperature of molten ferrous metal poured from a bottom pour transfer ladle over an extended period of time. A thick layer of molten slag is placed on the surface of the molten metal to suppress the formation of convection currents in the ladle. A formula provides the relationship between pouring time and the minimum thickness of the molten slag layer required to obtain a substantially constant temperature of the metal discharged from the ladle.

3,630,268

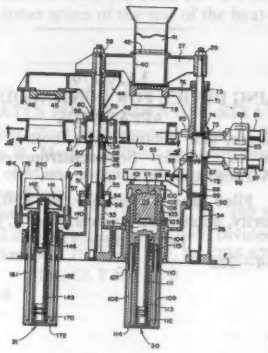
FOUNDRY MOLDING MACHINE WITH MEANS TO ALTERNATELY INDEX COPE AND DRAG FLASKS BETWEEN MOLDING AND CLOSING UNITS

Edmond K. Hatch, Brecksville, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sept. 8, 1969, Ser. No. 856,034

Int. Cl. B22c 11/10, 15/34, 17/00

U.S. Cl. 164—181 31 Claims



A foundry molding machine utilizing one cope and one drag flask alternately indexed between a jolt-squeeze molding station and a stripping and closing station, the drag being inverted during the index and molded upside down; a shuttle for the cope and drag patterns as well as a sand chute and squeeze board is provided at the molding station while the stripping and closing station automatically opens the specially built drag flask for stripping and supporting the same for coring before assembling with the cope to form a flaskless mold which is then removed from the machine.

3,630,269

CONTINUOUS CASTING CUTOFF APPARATUS

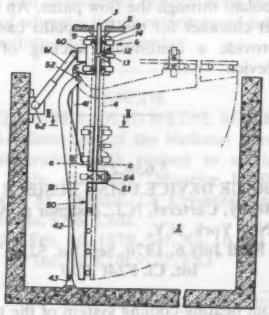
Hans Bieri, Oberrick, Switzerland, assignor to Erik Olsson AG, Zurich, Switzerland

Filed Mar. 10, 1969, Ser. No. 805,761

Claims priority, application Switzerland, Mar. 11, 1968, 3578/68

Int. Cl. B22d 11/12

U.S. Cl. 164—263 12 Claims



There is disclosed an apparatus for severing a continuously formed casting into sections. It comprises a carriage having a cutting torch movable transversely across the casting while it

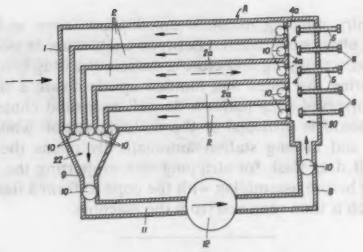
travels with the casting. The carriage travels along a guideway in the direction of the length of the casting, and it has two sets of clamps, one set being operable to engage the casting at one side of the cut, and the other being operable to engage the severed section. Provision is made to maintain the carriage centered in the guideway, but to permit controlled lateral movement where an irregularity in the casting requires it. For a vertical cutoff carriage, provision is made to transfer the severed section to a vertical frame which swings upwardly to a horizontal position for discharge of the severed piece.

3,630,270

COOLING DEVICE FOR CONTINUOUS CASTING APPARATUS

Alfred Adamec, and Roland Leder, both of Vienna, Austria, assignors to Wiener Schwachstromwerke Gesellschaft m.b.H., Vienna, Austria

Filed June 3, 1969, Ser. No. 830,057
Claims priority, application Austria, June 5, 1968, A 5334/68
Int. Cl. B22d *11/12*
U.S. Cl. 164—283 7 Claims



A cooling device for a continuous casting mold is arranged to provide a plurality of coolant flow paths extending in parallel relationship with the axis of the path of the casting through the mold. Valve means and connecting passageways are provided in the flow paths for adjustably regulating the flow of the coolant through the flow paths. An inlet chamber and the outlet chamber for the flow paths can be interconnected to provide a continuous cycling of the coolant through the device.

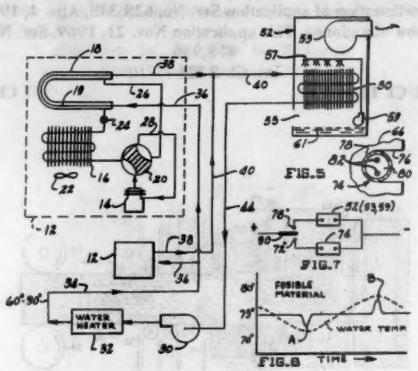
3,630,271

HEAT STORAGE DEVICE USING FUSIBLE MATERIAL

Herbert M. Brody, Carteret, N.J., assignor to American Standard Inc., New York, N.Y.

Filed July 6, 1970, Ser. No. 52,467
Int. Cl. F24f *3/00*
U.S. Cl. 165—22 7 Claims

A multiroom heating-cooling system of the type wherein a water loop extends through a plurality of room air-conditioning units to exchange heat therewith, the improvement comprising a novel heat storage mechanism for absorbing heat from the water loop during daytime operations and giving back the absorbed heat to the water loop during nighttime operations, thereby reducing the amount of heat energy required to be added to the circulating water by central station equipment.

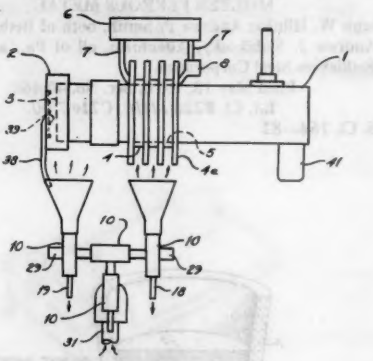


3,630,272

COMPOUND THERMAL SYSTEM FOR CLOSED CYCLE ENGINES

Donald A. Kelly, 58-06 69th Pl., Maspeth, New York, N.Y.

Filed Jan. 27, 1970, Ser. No. 6,116
Int. Cl. B60h *3/00*
U.S. Cl. 165—44 10 Claims



The compound thermal system for C. C. E.'s is intended to provide a versatile and reliable heating and cooling method for closed cycle engines, by adopting two separate thermal arrangements which are coordinated for optimum thermal exchange at minimum air pollution levels.

The basic heating means consists of a conventional gas or oil burner unit set to burn at a constant rate for minimizing toxic emissions.

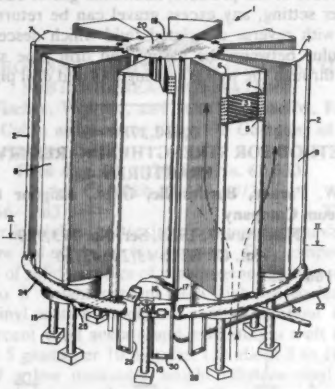
The basic cooling means consists of a specially formed liquid coolant jacket in direct contact with the cold surfaces of the engine.

The second thermal means consists of airflow temperature splitters—or vortex tubes arranged in series array with the hot and cold airflows directed over the hot and cold engine areas respectively.

The hot airflow from the seried vortex tubes is used primarily to raise the combustion temperature of the conven-

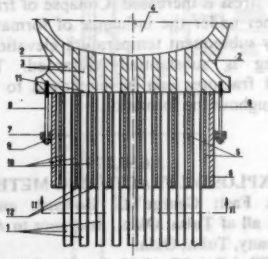
tional fuel burner unit in support of the complete combustion process.

3,630,273
AIR-COOLED CONDENSER
Paul G. La Haye, and David P. Flitner, both of Cape Elizabeth, Maine, assignors to General Electric Company
Filed Jan. 14, 1970, Ser. No. 2,842
Int. Cl. F28b 3/00
U.S. Cl. 165—111 8 Claims



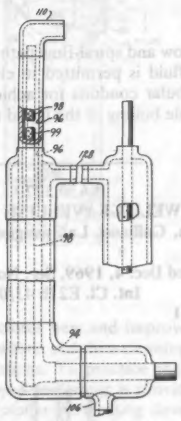
An air-cooled vapor-condensing plant having a plurality of individual air condenser modules joined together so that their inlet tube sheets together form a central vapor header, and also serve as primary structural members. Vapor enters the central vapor header, flows outwardly through heat exchange tubes where it is condensed by air flowing over the tubes.

3,630,274
HEAT EXCHANGER PROVIDED WITH A THERMAL BARRIER
Kornelis Lievense, Spijkenisse, Netherlands, assignor to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer
Filed May 21, 1969, Ser. No. 826,307
Claims priority, application Netherlands, May 30, 1968, 6807673
Int. Cl. F23f 13/00
U.S. Cl. 165—135 3 Claims



Heat exchanger for producing steam mainly formed by a casing in which a bundle of steam tubes is provided, attached between tube sheets and inside of which casing liquid metal such as sodium flows around these tubes as a heat-transferring medium, the transition area from tubes to tube sheet in this casing being provided with a thermal barrier to reduce the heat transfer from the sodium to the tube sheet and to the tubes near their attachment to the tube sheet, this thermal barrier being formed by a number of tubular spaces enclosing one or more tubes of the tube bundle along a part of their length(s) which tubular spaces are formed by a number of baffles together forming a grid and are closed on the one side by the tube sheet and on the other side are in open connection with the inner space of the rest of the heat exchanger casing.

3,630,275
APPARATUS FOR CONDENSING STEAM
Adrian A. Beaulieu, West Bridgewater; James L. McKenney, Norwell; James W. Megley, Milton, and Lawrence M. Munroe, Dover, all of Mass., assignors to Beaulieu-Munroe Corporation, Boston, Mass.
Original application Oct. 19, 1965, Ser. No. 497,961, now Patent No. 3,422,248, dated Jan. 14, 1969. Divided and this application Dec. 20, 1968, Ser. No. 785,674
Int. Cl. F28d 7/10
U.S. Cl. 165—154 2 Claims

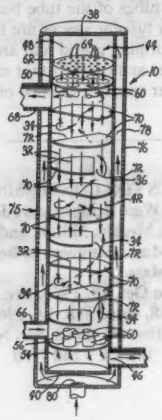


Apparatus for condensing steam comprising an elongated chamber, said chamber having an ingress and an egress opening, and a spray tube having a plurality of apertures therein extending into said chamber in concentricity therewith from one end thereof whereby liquid entering said tube is sprayed outwardly therefrom into the chamber.

3,630,276
SHELL-SIDE LIQUID METAL BOILER
T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Gerald M. Kikin, Pasadena; Maurice L. Peelgren, Altadena; Wayne M. Phillips, La Crescenta, and Jerry P. Davis, La Canada, all of Calif.
Filed Feb. 10, 1970, Ser. No. 10,161
Int. Cl. F28f 9/22; F22
U.S. Cl. 165—158 1 Claim

A shell-side liquid metal boiler including a tube and shell heat exchanger particularly suited for use in effecting a heat exchange between continuously flowing primary and secondary fluids within a two-loop Rankine cycle power system, characterized by a plurality of tubular conduits through which there is delivered a heated primary fluid, and a boiler

shell circumscribing the conduits defining a boiler chamber within which shell-side boiling of the secondary fluid is achieved, a feature of the invention being the provision of a plurality of mutually spaced, angularly related baffle plates mounted within the boiler and defining a tortuous path having both crossflow and spiral-flow path components, whereby the secondary fluid is permitted to circulate about the surfaces of the tubular conduits for achieving a heat exchange through shell-side boiling of the liquid metal within the boiler chamber.

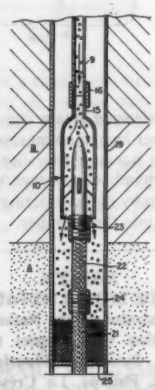


3,630,277

WELL GRAVELLING TOOL

Dallas C. Smith, Galliano, La., assignor to Jack D. McCartney, Jr.

Filed Dec. 4, 1969, Ser. No. 882,164
Int. Cl. E21b *43/04*
U.S. Cl. 166—51 **4 Claims**



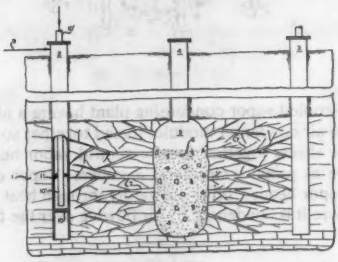
Apparatus for dispersing and packing gravel within the annulus of a tubular member positioned within a well comprising the combination of a drill pipe string and a well gravelling tool operatively communicated therewith. The well gravelling tool per se comprises a pair of concentric members, a smaller diameter member mounted within a larger diameter tubular member, the difference between the diameters being sufficient to provide an annular opening which is communicated to the opening through the drill pipe string. The drill pipe string and well gravelling tool are operatively engageable e.g., via threadable connections, one member with the other, and the well gravelling tool in turn is engageable, e.g., via threadable connection, of opposite cast, with a tubular member located within the bottom of the well to seal the interior of the latter from entry of fluid or gravel. Gravel can be discharged downwardly from the surface through the drill pipe string and well gravelling tool to fill the annulus of the well inside the casing, and outside the tubular element. Fluid can then be forced down into the well via the drill pipe string and well gravelling tool, under pressure, to pack the gravel. Upon release of the pressure, additional gravel can be added and, after setting, any excess gravel can be returned to the surface with reverse circulated fluid which descends down the annulus between the casing and drill pipe string, and ascends through the well gravelling tool and drill pipe string.

3,630,278

METHOD FOR STRENGTHENING RESERVOIR FRACTURES

Harry W. Parker, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 7, 1968, Ser. No. 773,989
Int. Cl. E21b *43/24, 43/26*
U.S. Cl. 166—259 **9 Claims**



Hydrocarbons are produced from hydrocarbon bearing formations, including oil shale, in situ through fractures communicating with production wells by injecting combustion supporting materials such as an oxygen-containing gas substantially completely throughout the fractures and then initiating in situ combustion (supported by the injected gas) at an extremity of the fractures prescribed by either injection or production wells or a subterranean detonation zone or cavity and directing the resultant in situ combustion front along the axis of the fractures and maintaining combustion at a level sufficient to fuse the formation adjacent the fractures whereby the resistance of the fractures to collapse under compressive stress is increased. Collapse of fractures treated in this manner under the influence of formation expansion promoted by subsequent temperature elevation accompanying retorting is substantially retarded. Therefore the strengthened fractures can be employed to facilitate heat transfer throughout the formation.

3,630,279

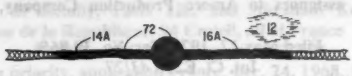
EXPLOSIVE FRACTURING METHOD

Clarence R. Fast; George C. Howard, and Morton A. Mallinger, all of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Oct. 27, 1969, Ser. No. 869,715
Int. Cl. E21b *43/26*
U.S. Cl. 166—281 **4 Claims**

This is a method for increasing the permeability of an underground formation adjacent a well bore. The first step is to

plug existing fractures in the formation from the interwell area to a location near the well bore. Next, the bore of the well and the fracture immediately adjacent to the bore are



filled with a liquid explosive which is stemmed. Then the explosive is detonated, forming new fractures into the previously unfractured portion of the formation.

3,630,280

METHOD AND COMPOSITION FOR TREATING SUBTERRANEAN FORMATIONS

Paul W. Fischer, Whittier, and John W. Scheffel, Fullerton, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 13, 1970, Ser. No. 63,633
Int. Cl. E21b *33/138, 43/26*
U.S. Cl. 166—283 **22 Claims**

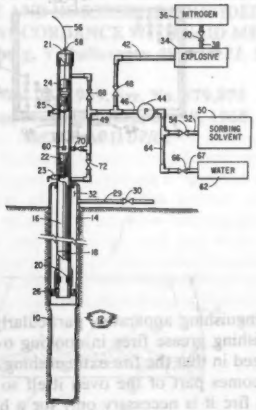
A water-insoluble particulate composition having controlled slow oil-solubility is disclosed. The composition is comprised of solid particles of a homogeneous mixture of (1) about 4 to 8 weight percent of a high molecular weight ethylene-vinyl acetate copolymer containing about 15 to 20 weight percent vinyl acetate and exhibiting a melt index of about 1 to 5 grams per 10 minutes, (2) about 3 to 10 weight percent of a low molecular weight ethylene-vinyl acetate copolymer containing about 15 to 20 weight percent vinyl acetate and exhibiting a melt index of about 100 to 600 grams per 10 minutes, and (3) about 86 to 92 weight percent of a paraffin wax having a melting point between about 135° and 170° F. Also disclosed is a process employing this particulate composition in drilling wells into subterranean formations having a temperature between about 125° and 155° F., and in fracturing and treating such formations.

3,630,281

EXPLOSIVE FRACTURING OF PETROLEUM BEARING FORMATIONS

Clarence R. Fast; George C. Howard, and Morton A. Mallinger, all of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Nov. 12, 1969, Ser. No. 875,843
Int. Cl. E21b *43/26*
U.S. Cl. 166—290 **8 Claims**



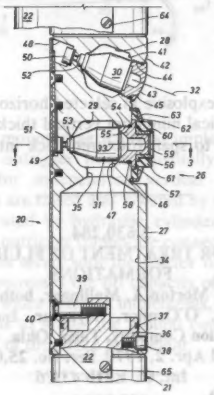
This is a method for increasing the permeability of an underground formation adjacent a well bore by explosive fracturing. In one embodiment an explosive slurry, having selected fracturing fluid characteristics, is used to hydraulically fracture the formation and such explosive slurry is subsequently detonated. In another embodiment a sorbent solvent slug is injected down the tubing preceding the injection of the explosive slurry and a second such sorbent solvent immediately follows the explosive slurry. This avoids trapping of air or other gas and therefore prevents premature ignition or detonation of the explosive fracturing fluid.

3,630,282

METHODS AND APPARATUS FOR PERFORATING EARTH FORMATIONS

C P Lanmon, II, Friendswood, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 20, 1970, Ser. No. 38,953
Int. Cl. E21b *43/117*
U.S. Cl. 166—297 **25 Claims**



This application discloses new and improved methods for perforating earth formations and then cleaning debris and the like from such perforations. To practice the present invention, a new and improved perforator is provided with one or more pairs of like or similar perforating devices operatively arranged for producing perforations in an earth formation which are selectively directed so that each pair of perforations will be in fluid communication with each other. An enclosed low-pressure chamber is coupled to one of the perforating devices in each set and a seal is arranged around the perforating axis of this perforating device for at least limiting the direct entrance of well bore fluids into the perforation produced thereby. In this manner, upon operation of each pair of the perforating devices, well bore fluids will be drawn into the perforation produced by the other perforating device and be swept through the intercommunicating perforations into the low-pressure chamber for cleaning debris and loose formation materials from the perforations.

3,630,283

METHOD OF PRODUCING PARTICLES OF ROCK IN A SUBTERRANEAN SITUS

Carroll Field Knutson, and Charles Robert Boardman, both of P. O. Box 15090, Las Vegas, Nev.

Filed Apr. 17, 1970, Ser. No. 29,589
Int. Cl. E21b *43/26*
U.S. Cl. 166—299 **4 Claims**

The method of producing an accumulation of broken rock in a subterranean situs which includes the steps of forming a system of fractures of predetermined minimum width in the earth above a cavity and selectively emplacing an explosive in the fractures. The selectivity of the explosive emplacement

is with respect to the vertical width of the fractures in which the explosive is placed, and is achieved by control of the mobility of the explosive, primarily, but not necessarily exclusively, through control of the explosive viscosity. After em-

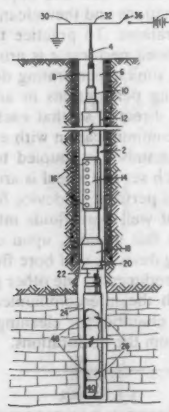
placement of the explosive in selected horizontally extending fractures of a critical minimum vertical thickness, the explosive is detonated to spall fractured rock into the subjacent cavity.

3,630,284

METHOD FOR TREATMENT OF FLUID-BEARING FORMATIONS

Clarence R. Fast; Morton A. Mallinger, both of Tulsa, Okla., and Donald J. O'Connor, Seymour, Ind., assignors to Amoco Production Company, Tulsa, Okla.

Filed Apr. 2, 1970, Ser. No. 25,064
Int. Cl. E21b *43/26*
U.S. Cl. 166—299 **5 Claims**



By the process of this invention, underground formations can be fractured through a series of steps comprising first building up pressure in a confined zone with a slow burning propellant sufficient to initiate the fracture. Thereafter, fast burning propellant present in the total charge is ignited to supply large volumes of gas at a pressure sufficient to extend the initiated fracture.

3,630,285

ACIDIZING HIGH-TEMPERATURE WELLS

Edwin E. Claytor, Jr., and Loyd W. Jones, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed May 22, 1970, Ser. No. 39,868
Int. Cl. E21b *43/27*
U.S. Cl. 166—300 **10 Claims**

A high-temperature earth formation is acidized by injecting down a well and into the formation a water-soluble ester of an organic carboxylic acid which forms a calcium salt which is also water-soluble. The formation should be at a temperature of at least about 200° F., and preferably at least about 300° F. Water may be injected before, after, or with the ester. The well is preferably shut-in after injecting the ester to permit more complete hydrolysis of the ester before the well is returned to its usual operation. Various combinations of esters or combinations of esters and free acids can be used. The ester may be injected as a solution in aqueous or nonaqueous solvents. Preferred esters are methyl formate and ethyl acetate.

3,630,286

PROCESS FOR REMOVING WATER FROM A BOREHOLE USING POLYMERIC FOAMING AGENT

Leonard John Persinski, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Sept. 28, 1970, Ser. No. 76,217
Int. Cl. E21b *21/00*
U.S. Cl. 166—309 **4 Claims**

An improved process for removing water from boreholes and the like comprising using as a foaming agent a copolymer of acrylamide and diacetone acrylamide.

ERRATUM

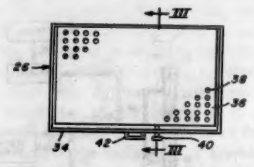
For Class 168—28 see:
Patent No. 3,630,289

3,630,287

FIRE-EXTINGUISHING APPARATUS FOR OVENS AND THE LIKE

Arnold S. Gold, 1325 Woodland Drive, Monroeville, Pa.

Filed May 20, 1970, Ser. No. 39,063
Int. Cl. A62c *3/00*
U.S. Cl. 169—2 R **5 Claims**



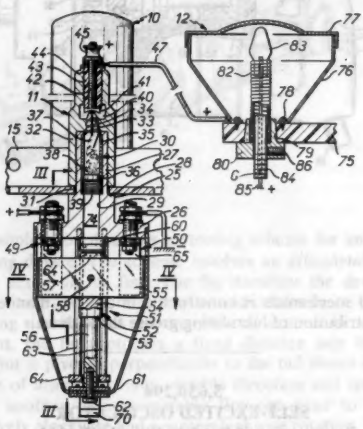
Fire-extinguishing apparatus, particularly adapted for use in extinguishing grease fires in cooking ovens and the like, characterized in that the fire extinguishing apparatus is built-in and becomes part of the oven itself so that upon occurrence of a fire it is necessary only for a housewife or other person using the oven to depress a button to actuate the extinguisher, either electrically or mechanically, to put out a fire within the oven.

3,630,288

FIRE PROTECTION DEVICE FOR VEHICLES

Adolphe Tiberti, 6 Rue Roubo, Paris 11e; Antoine Nobilio, 37 Blvd. de Reuilly, Paris 12e, and Abraham Kotyk, 14 Avenue de la Republique, 94 Creteil, all of France

Filed Dec. 23, 1969, Ser. No. 887,624
Claims priority, application France, Dec. 24, 1968, 180342
Int. Cl. A62c 3/00
U.S. Cl. 169—2 A 12 Claims



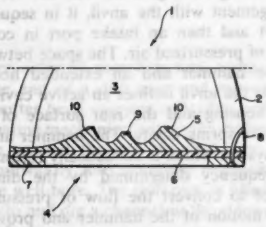
A fire protection device is mounted in an automobile and includes a switch responsive to a severe shock caused in an accident. An explosive cartridge is electrically connected to the switch for detonation and is mounted in a hollow body. A shaft having one end normally adjacent to the hollow portion of the body supports a switch blade normally connected in the ignition circuit and is adapted to engage a lever for operating a fire extinguisher. The shaft is slidably mounted and guided for movement between several columns. In response to a severe shock the explosion of the cartridge causes the shaft to move from its normal position thereby simultaneously opening the ignition circuit and actuating a fire extinguisher. All the elements but for the shock responsive switch are preferably mounted on a single support on the body of the automobile.

3,630,289

METHOD OF PROVIDING AND APPLYING A HORSESHOE AND HORSESHOE PROVIDED AND APPLIED IN ACCORDANCE WITH SAID METHOD

Ake Wilhelm Norberg, Valhallavagen 49, 114 22, Stockholm, Sweden

Filed Nov. 25, 1969, Ser. No. 879,875
Claims priority, application Sweden, Dec. 9, 1968, 16822/68
Int. Cl. A01l 07/02
U.S. Cl. 168—28 10 Claims



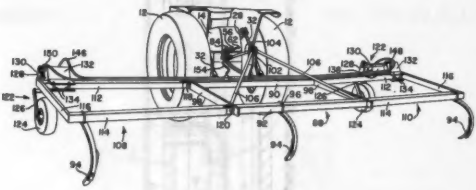
A padded horseshoe comprising a polymeric hoof pad completely filling the cavities between the frog and the horn wall underneath a horse hoof and a wear shoe, said horseshoe nailed to said hoof.

3,630,290

HYDRAULIC POWER LIFT SYSTEM FOR TRACTOR AND IMPLEMENT

Lamar Williams; Kenneth Earl Murphy, both of Cedar Falls, and Richard Wayne Hook, Des Moines, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 28, 1969, Ser. No. 819,649
Int. Cl. A01b 63/112, 63/22
U.S. Cl. 172—7 25 Claims



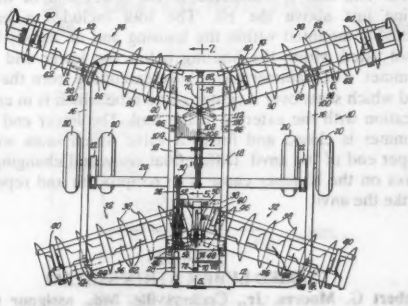
An integrally mounted agricultural implement is provided with a pair of outrigger frames pivotally connected to a center frame for independent vertical movement. The outrigger frames are raised and lowered by vertically adjustable wheels operated by hydraulic cylinders. The hydraulic cylinders on the outrigger frames are connected in series with each other and in series with the tractor rockshaft cylinder. The lift system increases the lift capacity of the tractor, permits the use of wider integral implements, permits wide integral implements to follow the ground contour, and retains full draft control of the entire implement.

3,630,291

DISC HARROW

George E. Womble, Kewanee, and Lorrin H. Schwartz, Kankakee, both of Ill., assignors to Kewanee Machinery & Conveyor Co., Kewanee, Ill.

Filed June 18, 1970, Ser. No. 47,339
Int. Cl. A01b 7/00, 21/08
U.S. Cl. 172—581 8 Claims



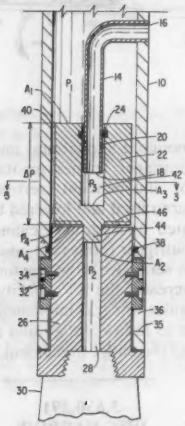
A disc harrow including a generally rectangular frame structure having front and rear pairs of disc gangs supported thereon, the front disc gangs having intermediate portions supported for longitudinal sliding movement and inner ends connected to a common connecting pin movable longitudinally of the frame structure, the rear disc gangs including intermediate portions pivotally connected to the frame structure adjacent the rearward corners thereof and inner end portions having elongated slots receiving a common connect-

ing pin movable longitudinally of the harrow, and adjustment means associated with each of the connecting pins for selective movement thereof to vary the angular relationship between the disc gangs and the longitudinal axis of the harrow.

3,630,292
VIBRATORY HAMMER DRILL

Renic P. Vincent, deceased, late of Tulsa, Okla. (by Meta Luella Vincent, administratrix), assignor to Amoco Production Company, Tulsa, Okla.

Filed Mar. 9, 1970, Ser. No. 17,409
Int. Cl. B23g 5/00; E21c 7/00
U.S. Cl. 173—17 **8 Claims**



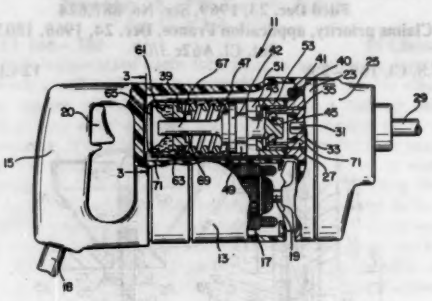
This invention relates to a fluid-actuated percussion tool for applying repeated blows to a drill bit in the drilling of wells. The tool is connected to the lower end of the drill string just above the bit. The tool includes a hammer slideably mounted within the housing and an axially hollow anvil fitted within the housing below the lower end of the hammer. The hammer has a bore extending from the upper end which seats over a center guide tube which is in communication with the exterior of the tool. The lower end of the hammer is closed and forms a valve which seats with the upper end of the anvil. Differential areas and changing pressures on the hammer cause it to reciprocate and repeatedly strike the anvil.

3,630,293
CLOSED LUBRICATION SYSTEM

Robert G. Moores, Jr., Cockeysville, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Oct. 2, 1970, Ser. No. 77,643
Int. Cl. B25d 11/00
U.S. Cl. 173—117 **8 Claims**

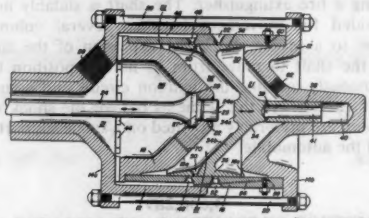
A portable electric device comprising a housing having an electric motor disposed therein. The motor includes a rotatable shaft carried by bearings supported upon the housing. The motor shaft rotates an output member which carries a rotatable tool bit. In addition, the motor shaft actuates a hammer mechanism adapted to deliver a series of longitudinal hammer blows to the rear end of the tool bit. The hammer mechanism is constructed in a novel manner to insure distribution of lubricating grease throughout.



3,630,294
SELF-EXCITED OSCILLATOR

John V. Bouyoucos, and Boyd A. Wise, both of Monroe County, N.Y., assignors to General Dynamics Corporation

Filed Jan. 5, 1970, Ser. No. 667
Int. Cl. E21b 1/00; B25d 9/00
U.S. Cl. 173—136 **10 Claims**



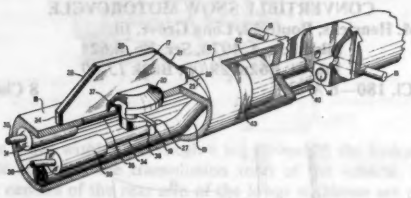
A self-excited pneumatic oscillator is described which includes a reciprocating hammer member adapted to impact an anvil. The hammer is disposed in a housing structure which includes a porting arrangement. As the hammer moves towards engagement with the anvil, it in sequence opens a discharge port and then an intake port in communication with a source of pressurized air. The space between the front surface of the hammer and an extended housing section which supports the anvil defines an active cavity. The space between the housing and the rear surface of the hammer defines a passive spring cavity. The hammer and these cavities define a system which is acoustically resonant and oscillates at a frequency determined by the dimensions and masses thereof to convert the flow of pressurized air into reciprocating motion of the hammer and provides isolation (minimizing pressure fluctuations) between the oscillator and the air source.

3,630,295

STEERING APPARATUS FOR SOIL-BURROWING MOLE

James C. Coyne, New Providence, and Robert G. McCoy, Whippany, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 10, 1969, Ser. No. 883,786
Int. Cl. E21b 7/04
U.S. Cl. 175—73 6 Claims



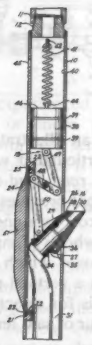
This application discloses a steering scheme for an earth-burrowing device. The scheme involves an articulatable tail with an active fin or fins. The fin stabilizes the device in steering situations where control would otherwise be lost, by permitting simultaneous steering and roll actions. In one embodiment, the fin protrudes a fixed distance into the soil stream but is pivoted perpendicular to the tail sleeve so that its angle of attack provides variable direction and speed of roll. In another, two retractable fins are used to impart respectively clockwise and counterclockwise rotation.

3,630,296

WELL BORE SIDEWALL SAMPLER TOOL

Luther Bullard, Casper, Wyo., assignor to Western Tool Corporation

Filed Dec. 30, 1969, Ser. No. 889,090
Int. Cl. E21b 9/34
U.S. Cl. 175—77 6 Claims



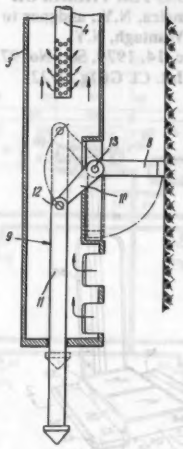
A well bore sidewall sampling tool comprises a casing secured to the end of a drill pipe and mounting therein a sample core cutter head carrying a flexible collection receptacle. An actuating mechanism within the casing, operated by fluid pressure applied through the drill pipe, extends the cutter head outwardly into sampling engagement with the sidewall of the well bore. The drill pipe is lifted to cause the head to bite into and dig a channel in the sidewall and obtain a sample therefrom.

3,630,297

DEVICE FOR BORING TRENCH SHAFTS

Petr Stepanovich Neporozhny, 3 Frunzenskaya ulitsa, 7, kv. 18; Evgeny Pavlovich Kravtsov, B. Dekabrskaya ulitsa, 3, kv. 20, both of Moscow; Semen Ilich Milkovitsky, ulitsa Nikolsko-Botanicheskaya, 2, kv. 10, and Roman Nikiforovich Tkachenko, ulitsa Rognedinskaya, 3, kv. 4, both of Kiev, all of U.S.S.R.

Filed Jan. 5, 1970, Ser. No. 613
Int. Cl. E21c 9/00, 11/00
U.S. Cl. 175—220 2 Claims



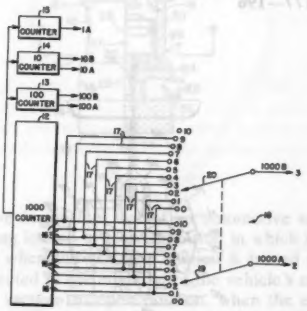
An apparatus for boring trench shafts in which the frame of a drill cat supports a boom from which a guide is suspended and the guide is rigidly connected at its upper end with the frame. A pilot member is mounted adjacent the lower end of the guide and is extensible in the direction of the trenching.

3,630,298

ELECTRICAL WEIGH SCALE WITH DIGITAL CUTOFF SYSTEM

Robert F. Orr, and William C. Susor, both of Toledo, Ohio, assignors to The Reliance Electric and Engineering Company, Toledo, Ohio

Original application Dec. 16, 1968, Ser. No. 783,831. Divided and this application Aug. 14, 1970, Ser. No. 63,734
Int. Cl. G01g 23/37, 19/417, 23/365
U.S. Cl. 177—46 3 Claims



A digital cutoff system comprising a weighing scale, means for producing digital signals in accordance with load upon

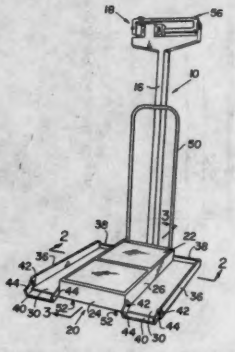
the scale, means for selecting a desired weight, and coincidence means for detecting coincidence between the digital signals and the desired weight and for detecting in at least one number place an additional digital signal greater than the desired digital signal in the number place. The additional digital signal forces the coincidence means to produce a cutoff signal even though the digital signals are greater than the desired weight.

3,630,299

PLATFORM WEIGHING SCALE AND LOADING ADAPTER THEREFOR

Raoul H. Albagli, Jamaica, N.Y., assignor to Scale Electronics Development Inc., Wantagh, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,673
Int. Cl. G01g *21/22*
U.S. Cl. 177—145 **9 Claims**



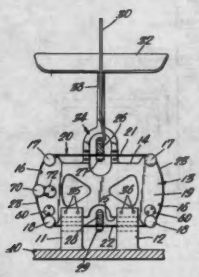
A portable adapter for weighing scale having a platform wherein the portable adapter has a top surface positioning upon the platform to form a part of the scale and for movement therewith. The adapter structure also includes tracks and ramps such that when the same is positioned upon a weighing scale, the scale is converted to enable a wheelchair and patient to be moved upon the scale for simultaneous weighing.

3,630,300

ADJUSTABLE TRUSS FOR TORSION BALANCES

Warren D. Weinstein, Huntington Station, L.I., N.Y., assignor to Henry Troemner Inc., Philadelphia, Pa.

Filed Mar. 25, 1969, Ser. No. 810,286
Int. Cl. G01g *1/24*
U.S. Cl. 177—196 **15 Claims**



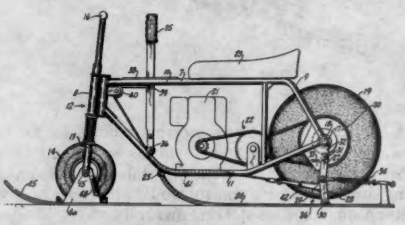
A torsion balance has a pair of load pans carried by trusses disposed between opposite ends of a pair of vertically spaced balancing beams which pivot on a central support truss. Each truss has a torsion band with an upper active run stretched between fixed upper corner spools and a lower active run stretched between movable lower corner spools. The lower corner spools engage cams which are rotated to vary the distance between the upper and lower active runs of the band to adjust the sensitivity of the balance to eccentric loads on its pans.

3,630,301

CONVERTIBLE SNOW MOTORCYCLE

Jon M. Henricks, Route 22, Long Grove, Ill.

Filed Feb. 4, 1970, Ser. No. 8,621
Int. Cl. B62m *29/00;* **B62k** *13/00*
U.S. Cl. 180—6 A **8 Claims**



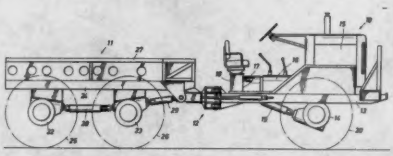
A riding-type vehicle supported at its front by a steerable ski and at its rear selectively be either a second ski or a pair of power-driven wheels with large balloon tires, as determined by the rider.

3,630,302

ARTICULATED VEHICLE HAVING CONTOUR CONTROL

John G. Holland, Sr., 648 Rocky River, Houston, Tex.

Filed Dec. 10, 1969, Ser. No. 883,701
Int. Cl. B62d *59/00*
U.S. Cl. 180—12 **12 Claims**



In accordance with an illustrative embodiment of the present invention, an articulated vehicle comprises a front motorized unit and a rear load-carrying unit connected together by a coupling that provides a vertical steering axis, a longitudinal horizontal roll axis and a transverse horizontal pivot axis to enable the wheels of said units to conform to the contour of the terrain over which said vehicle passes, and motor means reactive in a vertical plane and with respect to said horizontal pivot axis for selectively forcing said wheels to conform to the contour of said terrain.

3,630,303

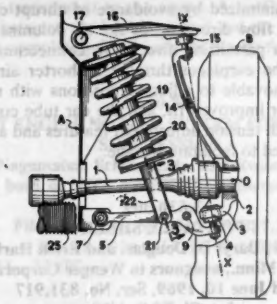
FRONT SUSPENSION FOR A FRONT DRIVE VEHICLE

Armand Froumajou, Pontoise, France, assignor to Automobiles Peugeot, Paris and Regie National des Usines Renault, Billancourt, France, part interest to each

Filed Feb. 25, 1969, Ser. No. 802,171
Claims priority, application France, May 15, 1968, 151820
Int. Cl. B60k *17/30;* **B60g** *3/20*
U.S. Cl. 180—43 **4 Claims**

A front suspension for a front drive vehicle having lower and upper wishbones and a damping support device including

a hydraulic jack and a coaxial coil spring. The lower part of the hydraulic jack is connected to the transverse support arm



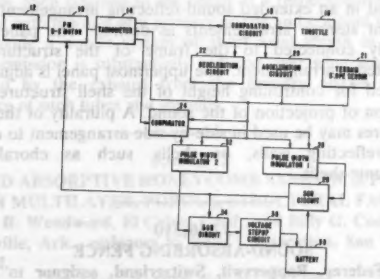
of the lower wishbone through a yoke whereby the hydraulic device straddles the transmission shaft of the vehicle. The pivot centers of the rear arm of the lower wishbone are on a line perpendicular to the wheel plane and the pivot centers of the steering link rod connecting the swivel axle unit of the wheel to the steering rack are on a line making an obtuse angle with the wheel plane.

3,630,304

OPTIMAL CONTROL SYSTEM FOR AN ELECTRIC MOTOR DRIVEN VEHICLE

Yilmaz E. Sahinkaya, Monrovia, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 28, 1969, Ser. No. 880,831
Int. Cl. H02p *5/00*; B60l *7/12*
U.S. Cl. 180—105 E **14 Claims**



Operating conditions experienced by a battery-operated vehicle driven by one or more permanent magnet or separately excited DC motors are sensed and converted into a control signal. The control signal is applied to a pulse width modulator which controls the conduction periods of SCR's in such a way that the average motor armature voltage is proportional to the control signal. In a motoring mode the pulse width modulator operates SCR's to supply current from the battery to the motor armature circuit. This mode usually occurs when the vehicle is moving uphill or accelerating on a level terrain. In a generating mode the pulse width modulator operates SCR's to supply current from the motor armature circuit to the battery. This occurs when the vehicle is moving downhill or is decelerating on a level terrain. The required mode of operation is accomplished automatically by the action of a motor armature current direction sensing circuit.

3,630,305

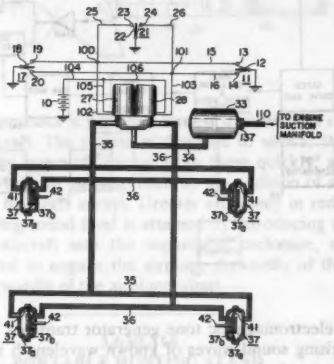
VEHICLE DOOR LOCK ARRANGEMENT

Kenichi Kazaoka, Asahi-machi, Kariya-shi, Japan, assignor to Aisin Seiki Company Limited, Kariya-shi, Aichi-ken, Japan

Filed Feb. 24, 1969, Ser. No. 801,637
Claims priority, application Japan, Feb. 23, 1968, 43/11120
Int. Cl. B60j *5/00*
U.S. Cl. 180—113 **12 Claims**

This invention relates to a door lock arrangement for an automotive vehicle having a plurality of vehicle doors, said arrangement comprising a door lock mechanism for each of said doors.

Each of the door lock mechanisms comprises a mechanical latching means consisting of a ratchet wheel and a ratchet pawl; and a pneumatic cylinders. Each of the door lock mechanisms is mounted on one of the vehicle doors. All the pneumatic cylinders are connected to a negative pneumatic pressure source such as the engine suction manifold. The cylinder space of each of the pneumatic cylinders is divided into two. The pneumatic communication of these two cylinder chambers is controlled by an electromagnetic valve assembly which is capable of being actuated by means of any



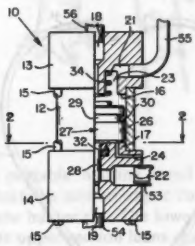
one of a plurality of electric switches, at least one of which is manually operated by the vehicle driver and a separate one of which is actuated by a vehicle running sensing means such as a speed change lever.

3,630,306

IGNITION-CONTROLLED MECHANISM FOR BLOCKING AUTOMOTIVE FUEL LINE

Victor Shur, Henrietta, N.Y., assignor to Ralph T. Cerame, Rochester, N.Y., a part interest

Filed Dec. 17, 1969, Ser. No. 885,666
Int. Cl. B60r *25/04*
U.S. Cl. 180—114 **9 Claims**

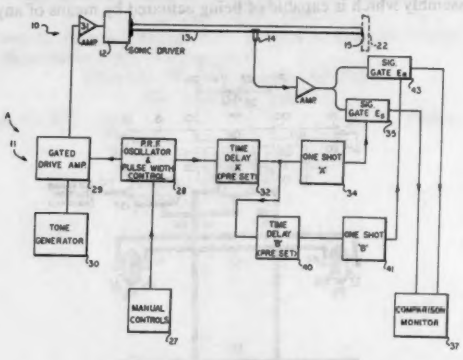


A first valve in the fuel line of an automotive vehicle is normally spring loaded to closed position in which it blocks the fuel line, when the vehicle's ignition is turned off. The valve is connected to the manifold of the vehicle's engine to be drawn by vacuum to open position, when the engine is running. A second valve, which is closed when the vehicle's ignition key is in ON position, but which is opened, when the ignition key is turned OFF, causes the manifold vacuum merely to suck in air, without opening the first valve, when the engine is turned over, with the ignition OFF so that a would-be thief, without a key to turn on the ignition, cannot start the vehicle.

3,630,307
MECHANISM AND METHOD FOR MEASURING SOUND ABSORPTION

Edwin C. Kamps, San Diego; Irwin A. Glibbery, Chula Vista, both of Calif., and Billy G. Cook, Booneville, Ark., assignors to Rohr Corporation, San Diego, Calif.

Filed Aug. 1, 1969, Ser. No. 846,732
Int. Cl. G01v 1/06
U.S. Cl. 181—.5 10 Claims

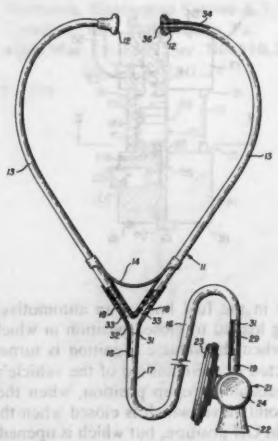


An electromagnetic tone generator transmits a tone burst comprising sound waves of known wavelength and intensity into one end of a tube, the other end of which tube is fitted against the surface of a material which reflects the sound waves back along the interior of the tube with a reduction in intensity proportional to their loss of acoustical energy. A microphone is exposed interiorly of the tube at a known distance from each end of the tube. Electronic time delay and gate circuitry feed into a monitoring circuit the electrical oscillations from the microphone produced by a selected series of clear sound waves of the original and the reflected sound bursts for a comparison of amplitudes.

3,630,308
STETHOSCOPE

Abe Ravin, 45 South Dahlia Street, Denver, Colo.

Filed May 28, 1969, Ser. No. 828,507
Int. Cl. A61b 7/02
U.S. Cl. 181—24 11 Claims

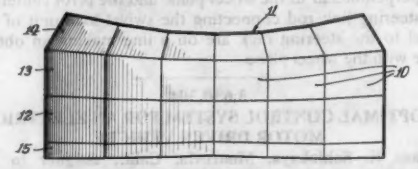


A stethoscope for improved auscultation providing small bell and diaphragm chest pieces selectively interconnectable to an air column channel having binaural branch ear tube components leading to the earpieces. Sound losses and attenuation are minimized by avoidance of abrupt changes in the volume and flow direction for the air columns and by a pivoting selector permitting direct flow connection of either chestpiece to the earpieces through a shorter air channel. Earpieces are movable to adjusted positions with respect to the ear tubes for improved fit, and the ear tube components are provided with tension adjustment features and are further pivotally mounted to facilitate storage.

3,630,309
PORTABLE SHELL

Jerry A. Wenger; Daryl D. Douglas, and Erich Harfmann, all of Owatonna, Minn., assignors to Wenger Corporation

Filed June 10, 1969, Ser. No. 831,917
Int. Cl. E04b 1/99
U.S. Cl. 181—30 27 Claims

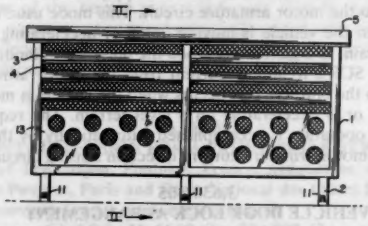


A portable acoustical shell structure arranged for reflecting sound. The shell structure arranged for reflecting sound. The shell structure is freestanding and is portably carried on a base which may be provided with suitable casters. The shell structure comprises a plurality of panels which are selectively disposed in an extended sound-reflecting arrangement or in different storage arrangements as desired. The panels are movably connected to the frame of the structure for facilitated rearrangement. The uppermost panel is adjustably mounted for controlling height of the shell structures and direction of projection of the sound. A plurality of the shell structures may be used in side-by-side arrangement to define sound-reflecting walls, or shells, such as choral and symphonic shells.

3,630,310
SOUND-ABSORBING FENCE

Kurt Federer, Rapperswil, Switzerland, assignor to U. F. Chemical Corporation, Woodside, N.Y.

Filed Oct. 6, 1970, Ser. No. 78,492
Claims priority, application Switzerland, Oct. 17, 1969, 15610/69
Int. Cl. E01f 7/00; E04b 1/74
U.S. Cl. 181—33 G 8 Claims



Sideline noise generated by airplanes on a runway, and noise generated by vehicles on a road may be contained by a fence essentially consisting of a supporting framework, a solid upright backing panel on the framework, and a layer of sound-absorbing foamed urea-formaldehyde or other plastic

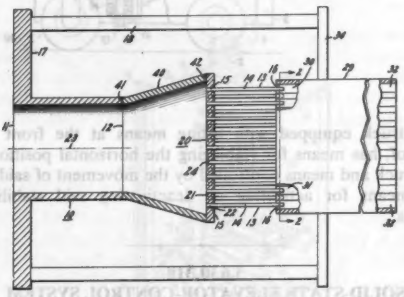
foam retained on the face of the plate directed toward the source of the noise by a screen of fabric, plastic, or metal practically transparent to the sound. A roof upwardly closes the space between the backing panel and the screen which is practically completely filled with the plastic foam.

3,630,311

JET ENGINE NOZZLE SYSTEM FOR NOISE SUPPRESSION

Henry T. Nagamatsu, Schenectady, and Russell E. Sheer, Jr., Cohoes, both of N.Y., assignors to General Electric Company

Filed July 31, 1969, Ser. No. 857,260
Int. Cl. F01n 1/14; B64d 33/06
U.S. Cl. 181—33 HC **3 Claims**



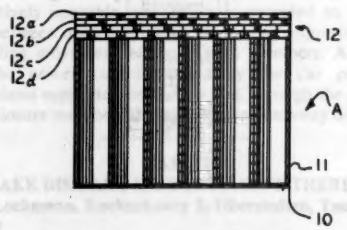
A plurality of secondary nozzles or tubes and a plurality of shrouds, each coupled to the outlet of a respective tube, are aligned with the axis of a primary nozzle and coupled thereto to provide a nozzle system of short axial length in which noise emission is substantially reduced over what would be emitted by the exhaust from the primary nozzle in the absence of such tubes and shrouds.

3,630,312

SOUND ABSORPTIVE HONEYCOMB SANDWICH PANEL WITH MULTILAYER, POROUS, STRUCTURAL FACING

James R. Woodward, El Cajon, Calif., and Billy G. Cook, Booneville, Ark., assignors to Rohr Corporation, San Diego, Calif.

Filed Nov. 7, 1969, Ser. No. 874,904
Int. Cl. E04b 1/84
U.S. Cl. 181—33 **3 Claims**



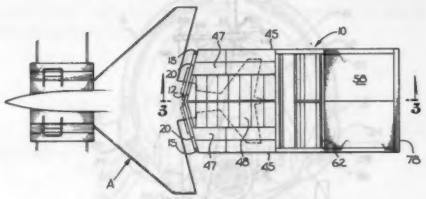
A sound absorptive honeycomb sandwich panel has a honeycomb core and a light sheet metal backing applied to one end thereof, and has also a porous facing comprising a plurality of layers of foraminous material of substantial structural strength with the layers arranged in random, closely superposed relation, applied to the other end thereof. The multilayer facing, the backing and the core are all integrally interconnected to form the sandwich panel.

3,630,313

NOISE SUPPRESSOR SYSTEM

Cloyd D. Smith, 14928 La Cumbre Drive, Pacific, Calif.

Filed Nov. 5, 1969, Ser. No. 874,259
Int. Cl. B64f 1/26; F01n 1/14
U.S. Cl. 181—33 HB **10 Claims**



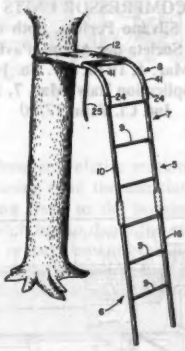
A noise suppressor is provided for test stands for jet engine powered aircraft. The system is designed to silence the exhaust gases by removing energy from them quickly, and to this end provides for cooling, both by the addition of secondary air and by water sprays. Greater efficiency in reducing the surrounding sound level is attained by introducing a portion of the aircraft into the suppressor enclosure, means being provided to engage the airplane forwardly of the engine and rearwardly of the airplane wings.

3,630,314

PORTABLE HUNTING STAND

Milton D. Bamburg, Rt. 4, Box 502, West Monroe, La., and Bobby R. Russel, Route 1, Calhoun, La.

Filed Nov. 18, 1970, Ser. No. 90,723
Int. Cl. E06c 7/48, 7/50
U.S. Cl. 182—116 **15 Claims**



A lightweight, portable hunting stand including two or more ladderlike sections and an upper curved platform section upon which the hunter sits. The lower section rests upon the ground and the upper section leans against a tree trunk.

3,630,315

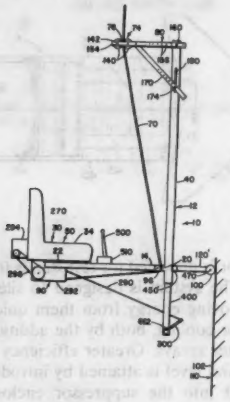
SEAT SCAFFOLD

Robert A. Meyer, 133 No. California St., Hastings, Nebr.

Filed Sept. 8, 1970, Ser. No. 70,266
Int. Cl. E04g 3/16
U.S. Cl. 182—142 **11 Claims**

A scaffold suspended from a single cable and having an operator-supporting area substantially spaced rearwardly from its forward side, a cable guide means attached to an upper part of the frame of the scaffold and disposed a substantial and preferably adjustable distance from a forward

side of the frame and toward a position above the position of the operator, whereby the downward force of the weight of the operator is partially counterbalanced, wheel means on the forward side of the frame and below the operator's position for engaging the outer surface of a building so as to counteract the remainder of the downward force of the operator on the frame, the wheels being adjustably positionable greater and lesser distances to the right and left of the frame respectively, a winch on the frame attaching the cable.

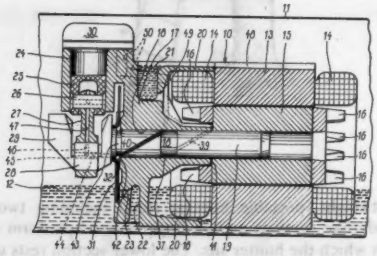


3,630,316

LUBRICATING DEVICE FOR ENCLOSED MOTOR COMPRESSOR UNITS

Pietro Sillano, and Silvano Perlino, both of Pavia, Italy, assignors to Necchi Societa per Azioni, Pavia, Italy

Filed Mar. 4, 1970, Ser. No. 16,388
Claims priority, application Italy, Mar. 7, 1969, 32406 A/69
Int. Cl. F16n *17/00*
U.S. Cl. 184—6.16 **3 Claims**



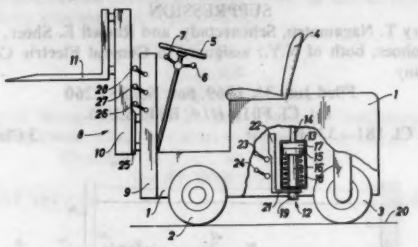
An assembly for lubricating an enclosed horizontal compressor motor comprising a disc mounted on the motor shaft adjacent a flat surface containing a groove which communicates with a lower oil reservoir and an upper sump, from which sump lubricant flows into a recess in said motor shaft and thence through oppositely extending helical grooves in said motor shaft to rotor cooling fins which spray lubricant onto stator coils and through ducts in said motor shaft and in a piston connected to said motor shaft to lubricate a piston cylinder.

3,630,317

ARRANGEMENT FOR STABILIZATION OF TRUCKS

Knut Folke Jacobsson, Kulorgatan 49, 421 65, Vastra Frolunda, Sweden

Filed Oct. 24, 1969, Ser. No. 869,208
Claims priority, application Sweden, Oct. 16, 1968, 13924/68
Int. Cl. B66b *9/20*
U.S. Cl. 187—9 **5 Claims**



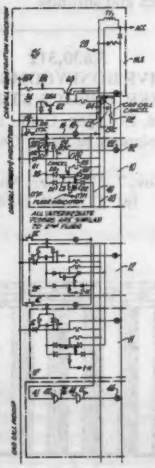
A truck equipped with lifting means at the front end thereof, has means for stabilizing the horizontal position of the truck and means controlled by the movement of said lifting means for activating or deactivating said stabilizing means.

3,630,318

SOLID-STATE ELEVATOR-CONTROL SYSTEM

James H. Stichweh, Princeton, Ind.; Stephen A. Hornung, Neuilly-sur-Seine, France, and Paul Duckwall, III, Louisville, Ky., assignors to M. K. White Company, Inc., Louisville, Ky.

Filed Feb. 13, 1970, Ser. No. 11,042
Int. Cl. B66b *3/00*
U.S. Cl. 187—29 R **24 Claims**



A system for registering service calls in an automatic elevator-control system is disclosed wherein a single-wire connection is made between the car and the hall call selectors, and the indicator lights located in a centrally located control panel. That circuit includes a switch in the form of a silicon-controlled rectifier which provides sufficiently high current to operate several such indicator lamps as well as providing sufficient current to the call above and call below indicating and driving circuits. Also disclosed is a system for deriving

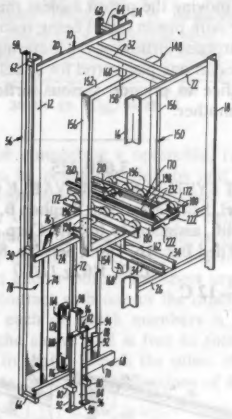
control signals for the call above and below circuits which comprises means for comparing the position of the elevator car with a signal derived from the service call registering circuit to direct a control signal to actuate the desired circuit in accord with the relative position of the designated car position and its present position.

3,630,319

ELEVATOR AND DOOR AND LOADING MECHANISMS THEREFOR

Harold Marven Peterson, San Francisco, and Scott F. Andersen, Fairfax, both of Calif., assignors to San Francisco Elevator Company, Inc., San Francisco, Calif.

Filed Dec. 12, 1969, Ser. No. 884,652
Int. Cl. B66b *13/12*
U.S. Cl. 187—58 **3 Claims**



A dumbwaiter-type elevator capable of being employed in an elevator shaft having hatchways disposed at peripherally spaced locations therearound. To accommodate the peripherally spaced hatchways the elevator car is provided with a rotatable load-supporting carriage and self-contained driving and indexing mechanisms for the carriage. The carriage is provided with selectively extensible and retractable load-transferring mechanism to accommodate the smooth transition of a load between the hatchways and the car and maintain the load in a level condition while in the car. The car also carries powered closure members which are movable between open and closed conditions relative to the load-supporting carriage. The hatchways are provided with doors and a selectively operable mechanism is provided to move the doors between open and closed conditions responsive to corresponding movement of the closure members. A common hydraulic power circuit carried by the car powers all mechanisms supported on the car and, through the operation of the closure member, also powers the hatchway doors.

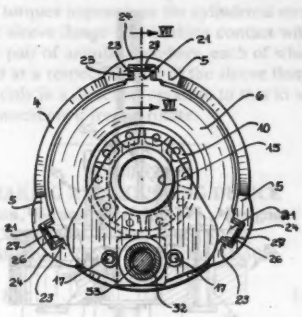
3,630,320

BRAKE DISK AND SUPPORT MEANS THEREFOR

Heinz Lochmann, Kuckucksweg 5, Oberstedten, Taunus, Germany

Filed July 28, 1969, Ser. No. 845,241
Int. Cl. B60t *1/06*
U.S. Cl. 188—18 A **6 Claims**

A disk brake is disclosed for a rotating element mounted on an axle journaled in an axle housing. The rotating element, e.g. a wheel, windlass or winch drum, is provided with a brake-disk carrier having a plurality of angularly spaced axial projections reaching in the direction of the axle housing. The disk and these projections are provided with grooves and mating lugs enabling axial movement of the disk, the grooves being bridged to prevent distortion. One brake shoe is mounted on the axle housing and confronts the disk surface remote therefrom while the other brakeshoe is shiftably actuatable disposed in a structure offset from the axle housing but secured thereto.

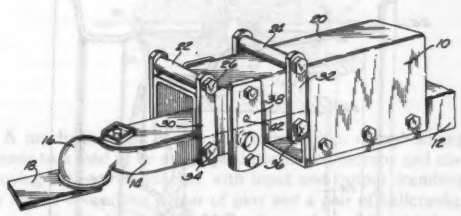


3,630,321

SURGE BRAKE DAMPER

Harold S. Hollnagel, 918 Laramie Lane, Milwaukee, Wis.

Filed June 5, 1970, Ser. No. 43,662
Int. Cl. B60t *7/20*
U.S. Cl. 188—112 **4 Claims**



In use, there is frequent relative motion between the surge brake actuator housing (and the associated trailer) and the hitch bar. The arms fixed to the housing hold the friction pads against the hitch bar to damp the relative motion. This damping replaces or supplements the hydraulic shock absorber usually associated with surge brake units. The loading applied to the friction pads is adjustable to control the rate of brake application.

3,630,322

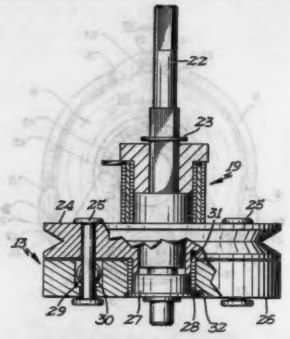
DYNAMIC BRAKE

James L. Keely, Wayzata, and Larry D. Quanrud, Minneapolis, both of Minn., assignors to Washington Scientific Industries Inc., Long Lake, Minn.

Filed July 27, 1970, Ser. No. 58,253
Int. Cl. B60t *7/12*
U.S. Cl. 188—135 **4 Claims**

A dynamic-braking apparatus adapted to halt film movement in a microfilm viewer such that individual film frames may be easily selected. Particularly useful at high-film speeds, this braking apparatus comprises a pulley to receive braking torque and a weight which is connected to the pulley by a torsion spring. The braking force on the pulley is opposed by the inertial force of the weight, causing end displacement of the spring, resulting in its contraction and its transmission of braking torque to the shaft from which the film is being fed. The degree and rate of brake torque transmission are further controlled by means of a further connec-

tion between the pulley and the weight which allows only limited relative movement between the parts. Compression



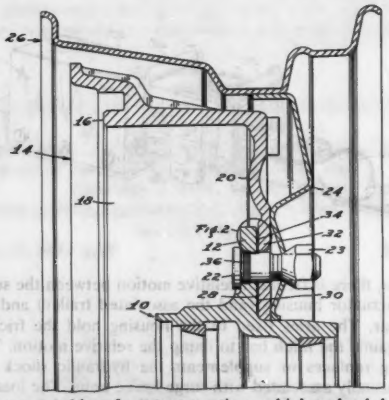
springs are provided to prevent "noise" and to insure return of the torsion spring to an equilibrium position.

3,630,323

BRAKEDRUM AND HUB ASSEMBLY

Daniel J. Hickle, Williamston, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 31, 1968, Ser. No. 772,250
Int. Cl. F16d *65/10*
U.S. Cl. 188—218 R **2 Claims**



An assembly of an automotive vehicle wheel hub and brakedrum and method of assembly wherein the mutually engaging mounting surfaces of the hub and drum, located in the annular zone where the drum is attached to the hub by the usual hub wheel mounting bolts, having interposed between them when properly aligned a plastic material which fills the voids between the surfaces and hardens to rigid material. This filler material eliminates distortion of the drum when the hub and drum assembly are mounted to a wheel and subjected to the clamping stress of the mounting bolts, thereby eliminating roughness, chattering and/or noise when the wheel brakes are applied.

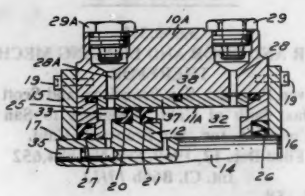
3,630,324

MOVEMENT CUSHIONING DEVICE

Elvin L. Stretten, and Ivan J. Stretten, both of Union Lake, Mich., assignors to Dallas Industries, Inc., Troy, Mich.

Filed Dec. 12, 1969, Ser. No. 884,558
Int. Cl. F16f *9/02*
U.S. Cl. 188—312 **2 Claims**

A movement cushioning device using compressed air having a piston dividing a cylinder into two sealed chambers and two piston rods on the piston extending in opposite directions from the piston and outwardly of the cylinder; the piston having a metering orifice providing the only air communication between the chambers, and means for introducing compressed air to one or both of the chambers. Imposed force on



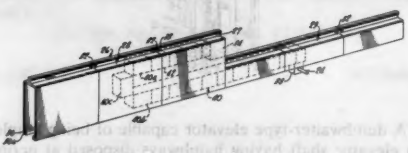
a piston rod moving the piston against the compressed air in one chamber with piston travel being restrictively allowed by the rate of throttled airflow of the metering orifice. A throttle pin is threaded in one piston rod for selectively occluding the metering orifice to provide various airflow rates from one chamber to another.

3,630,325

SUPPORT SYSTEM FOR MOVABLE CONDUCTORS

James A. Corl, San Carlos, and Stephen B. Sprague, San Jose, both of Calif., assignors to Insul-8-Corp., San Carlos, Calif.

Filed Dec. 16, 1969, Ser. No. 885,427
Int. Cl. H02g *11/00*
U.S. Cl. 191—12 C **17 Claims**



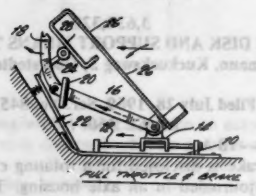
A segmented plastic tube having integral hinges is folded in two sections joined by a 180° loop and extended between a fixed station and a station movable with a piece of equipment along a predetermined path. Flexible conductors and conduits for providing power and fluids to the equipment extend between the stations and are confined and supported within the tube as the movable station and tube are slid within a supporting housing.

3,630,326

ACCELERATOR AND BRAKE PEDAL COMBINATION

Yukinori Kawaguchi, 2740 Nakookoo St., Honolulu, Hawaii

Filed July 27, 1970, Ser. No. 58,397
Int. Cl. B60k *29/02*
U.S. Cl. 192—3 S **1 Claim**



A foot mounted attachment for a vehicle which replaces separate accelerator and brake pedals. With one foot in the

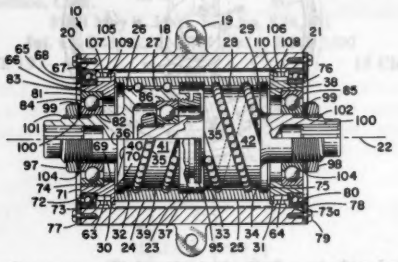
attachment, the vehicle can be accelerated or braked, depending upon the foot position.

3,630,327

BRAKING AND COUPLING MECHANISM

Roy A. Nelson, Grand Prairie, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed Aug. 24, 1970, Ser. No. 66,419
Int. Cl. F16d 57/10
U.S. Cl. 192—8 R 18 Claims



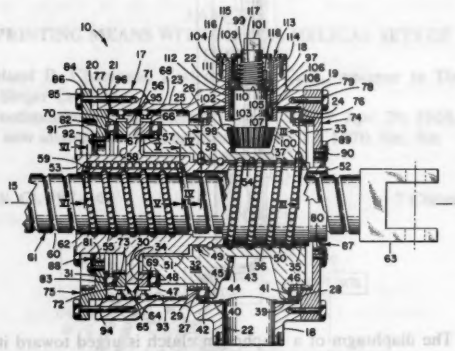
A mechanism for connecting a reversible, rotary driving means to a load to be positioned thereby and employing a sleeve having opposite end portions engaged by oppositely directed threads or the like with input and output members that are rotatable but not translatable relative to each other. Forces imposed on the sleeve and originating in torques imposed on the input and/or output members urge the sleeve ends into braking contact with one or the other of a pair of annular members, each of which members is located at a respective end of the sleeve and is free to rotate only in a direction opposite to that in which the other of such members is free to rotate. Several modifications of the invention are disclosed.

3,630,328

LINEAR ACTUATOR WITH BRAKING DEVICE

Roy A. Nelson, Grand Prairie, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed Aug. 24, 1970, Ser. No. 66,423
Int. Cl. B60t 7/14; F16h 1/16
U.S. Cl. 192—8 R 11 Claims



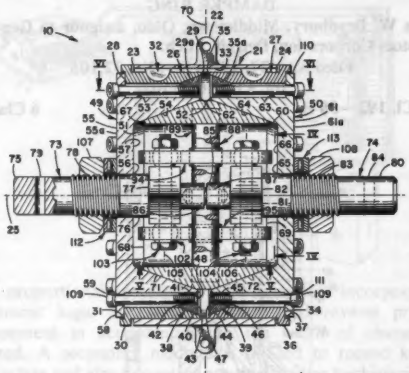
An actuator for connecting a reversible, rotary driving means to a load to be linearly moved and positioned thereby and employing a sleeve having a flange externally formed on one end portion thereof and having an external thread or the like on the opposite end portion. An internal thread or the like, directed oppositely to the external thread, is formed in the sleeve end portion having the external flange. The sleeve is coaxially positioned within and its external thread engaged with a generally cylindrical structure. A threaded shaft is coaxially positioned within and its thread engaged with the sleeve internal thread. Forces imposed on the sleeve and originating in torques imposed on the cylindrical structure or shaft urge the sleeve flange into braking contact with one or the other of a pair of annular members, each of which members is located at a respective side of the sleeve flange and is free to rotate only in a direction opposite to that in which the other of such members if free to rotate.

3,630,329

BRAKING AND COUPLING DEVICE

Roy A. Nelson, Grand Prairie, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed Aug. 24, 1970, Ser. No. 66,509
Int. Cl. F16d 67/00
U.S. Cl. 192—8 R 13 Claims



A mechanism for connecting a reversible, rotary driving means to a load to be moved and positioned thereby and employing a sleeve connected with input and output members by means comprising a pair of pins and a pair of bellcranks. A pair of cylindrical members, each member of the pair having a recess occupying substantially all of one end, an external flange which is coplanar with the other end, and a centrally located aperture therethrough, is coaxially positioned within a supporting structure that is fixedly mounted on a fixed structure. The cylindrical member ends containing the recesses mutually confront each other. The sleeve is coaxially positioned within the supporting structure with opposite end portions of the sleeve extending within the cylindrical member recesses. The input member extends through one cylindrical member aperture, and the output member extends through the other cylindrical member aperture. Forces imposed on the sleeve and originating in torques imposed on the input and/or output members urge the sleeve into braking contact with one or the other of the cylindrical members, each of which cylindrical members is free to rotate only in a direction opposite to that in which the other of such member is free to rotate.

3,630,330

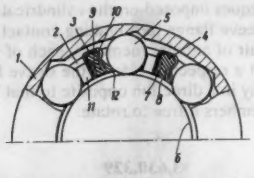
OVERRUNNING ROLLER CLUTCH

Wolfgang Pflugner, Herzogenaurach, Germany, assignor to Industriewerk Schaeffler, OHG, Herzogenaurach, Germany

Filed May 12, 1970, Ser. No. 36,560
Claims priority, application Germany, June 11, 1969, G 69 23 286.6
Int. Cl. F16d 41/07
U.S. Cl. 192—45 4 Claims

A novel grip overrunning roller clutch consisting of an inner or outer race provided with camming surfaces and a

cage connected thereto to secure it against rotation relative to the race, the cage being provided with crossbars on which spring elements are mounted by holding clips which surround



the radially directed lateral surfaces of the crossbars and which make the grip rollers resilient in the circumferential direction.

3,630,331

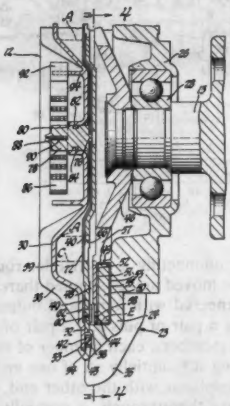
VISCOUS SHEAR CLUTCH WITH FREE-FLOATING DAMPER RING

James W. Bradbury, Middletown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1970, Ser. No. 32,105

Int. Cl. F16d *35/00*

U.S. Cl. 192—58 B **6 Claims**



A viscous fluid clutch including relatively rotatable first, second and third drive members having two (2) fluid shear spaces therebetween which are cooperable with a fluid medium in the shear spaces to provide a resultant variable speed differential between the first and third members, an annular reservoir for at times storing the fluid medium, a temperature-responsive valve for controlling the flow of the fluid medium from the annular reservoir through an inlet port to the fluid shear spaces, continually open outlet ports and cooperating pump elements or wipers for forcing the fluid medium from the fluid shear spaces to the reservoir, the second or intermediate drive member being a loose ring member having a fluid shear or "slip-speed" relationship along each face thereof with the adjacent respective first and third drive members for prolonging the operational life of the fluid medium.

3,630,332

TRANSVERSE FRICTION CLUTCH

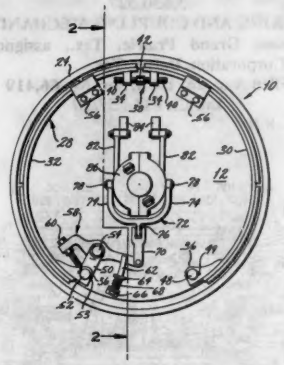
John H. Price, 163 Frey Lane, Belleville, Ill.

Filed Sept. 2, 1969, Ser. No. 854,708

Int. Cl. F16d *13/14, 13/75*

U.S. Cl. 192—77 **10 Claims**

A C-shaped clutch friction means includes at least two arcuate bands having high-friction linings mounted on their outer arcuate surfaces. The bands each have a first end adapted to pivotally receive a link and a second end having a bolt-receiving bracket. The bands are joined together at their



second ends by a bolt which threadably engages the bolt-receiving brackets so that the bands are free to swivel about the longitudinal axis of the bolt.

3,630,333

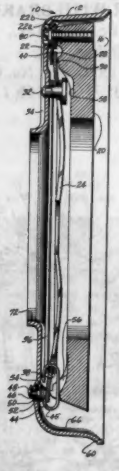
CLUTCH WITH DIAPHRAGM AND CLIP SPRINGS FOR PARALLEL

Paul J. Schiefer, Sherman Oaks, and James D. McFarland, Jr., Chatsworth, both of Calif., assignors to Schiefer Manufacturing Company, Monterey Park, Calif.

Filed Jan. 2, 1970, Ser. No. 265

Int. Cl. F16l *23/20*

U.S. Cl. 192—99 A **10 Claims**



The diaphragm of a diaphragm clutch is urged toward its engagement position by assist springs to overcome the effect of centrifugal force which tends to keep the diaphragm in its disengaged position. The assist springs are coupled to the diaphragm and the clutch cover to prevent their displacement by centrifugal force. To this end, a hook-shaped portion of each assist spring engages the inside of a pair of pivot rings for the diaphragm to secure the assist springs at one end. The other end of each assist spring is received in a hole

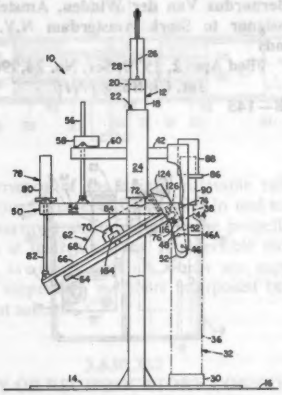
in the clutch cover. For rigidity, the clutch cover is adapted for full 360° register with a flywheel and employs reinforcing ribs proximate the anchor points on the clutch cover of the drive straps which carry the pressure plate.

3,630,334

EMBOSSING APPARATUS FOR CURVED CONTAINER SURFACES

John J. Connolly, deceased, late of Millbrae, Calif. (by Marie Z. Connolly, administratrix), and Richard B. Newhall, El Cerrito, Calif., assignors to Coyne Cylinder Company, San Francisco, Calif.

Filed May 9, 1969, Ser. No. 824,031
Int. Cl. B41j *1/30*; B41f *17/18*; B44b *5/00*
U.S. Cl. 197—6.7 **15 Claims**



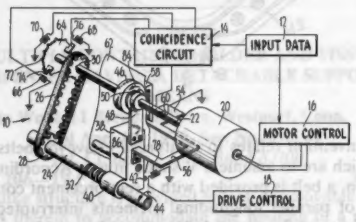
An embossing apparatus particularly well adapted for embossing symbols on relatively thin walled hollow articles such as containers. An embossing tool is mounted in a holder and its embossing section is rolled over the outer container surface while subjected to low impact forces from an impacting gun. The container is movable in a first direction to permit the embossing of the symbols in a row and the holder allows movement of the embossing section of the tool in a second, transverse direction for the embossing of the symbols in parallel, spaced rows. Means are provided to permit the automatic embossing of symbol sequences such as words.

3,630,335

PRINTING MEANS WITH PLURAL HELICAL SETS OF TYPE

Leland D. Chamness, Castro Valley, Calif., assignor to The Singer Company

Continuation of application Ser. No. 724,880, Apr. 29, 1968, now abandoned. This application July 22, 1970, Ser. No. 64,036
Int. Cl. B41j *1/32*
U.S. Cl. 197—49 **7 Claims**



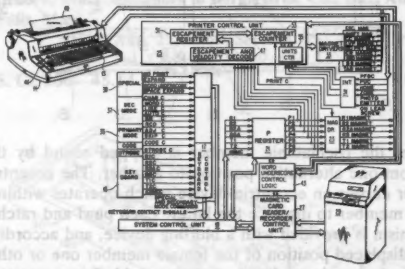
A font wheel having a plurality of character types arranged in predetermined groups of helixlike patterns is mounted for continuous rotation about its axis and for continuous translation along its axis adjacent a sheet of paper on which selected characters are to be printed in a row along the axial direction of translation. A print hammer disposed behind the paper travels axially with the font wheel and is driven toward the paper and font wheel at selective times to cause printing of selected characters in response to input data and font wheel position signals. Horizontal spacing between adjacent printed characters is dependent upon groups of character types included in the selected character to be printed.

3,630,336

PROPORTIONAL SPACING PRINTER INCORPORATING WORD UNDERSCORE CONTROL

Carl F. Johnson, and William R. McCray, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1970, Ser. No. 28,816
Int. Cl. B41j *29/26*
U.S. Cl. 197—113 **6 Claims**



A proportional spacing typewriting system incorporating electronic logic to control forward and reverse printer escapement in accordance with the width of characters printed. A secondary medium is utilized to record keyed characters and also to control printing. Printer backspacing is effected by reading a previously recorded character from the secondary medium corresponding to the character representation immediately preceding the print point in order to determine the escapement value of that character and thereafter by controlling the reverse escapement of the printer by a corresponding amount. Word underscore control logic recognizes interword characters and causes the printer to reverse escape over a complete word so that underscore characters can thereafter be printed under the previously printed characters of the word. The control logic insures that the underscore characters so printed properly align with the rightmost portion of the last character of the underscored word by causing the printer to backspace a proper amount immediately prior to printing the last underscore character. A special word underscore code is recorded on the secondary medium when the keyed characters are recorded. The code can thereafter be recognized on subsequent playout to effect word underscore operations. Additional logic recognizes sequences of backspace codes and underscore codes on the medium as a word underscore operation during playout. Special error control circuits facilitate operator control and understanding of system operations.

3,630,337

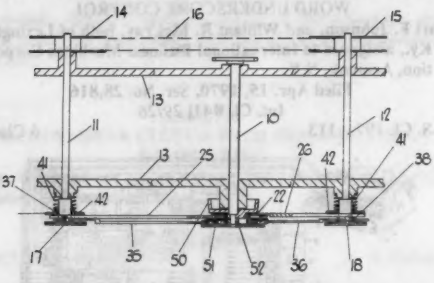
RIBBON FEED AND REVERSING MECHANISM FOR TYPEWRITERS

Edward Victor Byers, 17 Cavendish Crescent, The Park, England

Filed Dec. 18, 1969, Ser. No. 886,262
Claims priority, application Great Britain, Dec. 20, 1968, 60,540/68
Int. Cl. B41j *33/46*
U.S. Cl. 197—162 **4 Claims**

A typewriter is provided with ribbon feed and reversing mechanism whereby when one ribbon spool becomes empty

and the other correspondingly becomes full, the resistance to rotation of one or other spool causes the drive to be reversed so that as typing proceeds the ribbon is progressively wound back from the full spool to the empty one. There is a driving spindle which is rotated to and fro as the carriage makes its alternative typing and return traverses and racks one or other of two spool spindles through pawl and ratchet mechanisms. The driving spindle carries a cam which rotates inside an oscillatable member, and if the latter is prevented from rotating, oscillates the latter to operate the pawl and ratchet mechanisms. Upon one of these mechanisms encountering undue resistance to operation due to resistance of its spool to



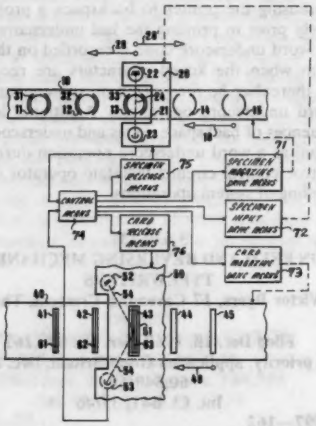
rotation, the oscillatable member is stepped round by the cam from one alternative position to another. The eccentric member carries an eccentric device which operates within a female member to displace the latter. Each pawl and ratchet mechanism is provided with a bluffing device, and according to the displaced position of the female member one or other of these devices is rendered operative to bluff its associated pawl and ratchet mechanism (thereby discontinuing the drive to the associated spool spindle) and the other of these bluffing devices is rendered inoperative to bluff the associated pawl and ratchet mechanism and the drive is thereby transferred to the other spool spindle.

3,630,338

SPECIMEN-ANALYZING APPARATUS

Rudolf Oberli, Langenthal, Switzerland, assignor to Greener Electronic AG, Langenthal, Switzerland

Filed Sept. 2, 1970, Ser. No. 68,934
Claims priority, application Switzerland, Sept. 5, 1969, 13475/69
Int. Cl. B65g
U.S. Cl. 198—1 **11 Claims**



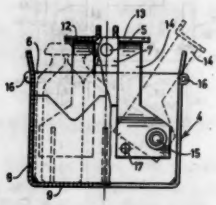
Automatic specimen-analyzing apparatus for performing selected analyses of specimens in accordance with information contained on origin cards associated therewith, respectively, characterized in that improved means are provided for correlating with the successive supply of the specimen containers into storage locations in a specimen magazine the supply of the corresponding origin cards into card storage locations in a card magazine. Detector means are provided for determining whether or not a given location of each magazine is in a filled condition. When these given locations are determined to be correctly filled, the magazines are displaced in a step-by-step manner relative to the supply means associated therewith to permit a specimen container and the corresponding origin card to be deposited in the storage locations immediately following said given locations.

3,630,339

CONVEYOR WITH SUSPENDED RECEPTACLES

Johannes Bernardus Van der Winden, Amstelveen, Netherlands, assignor to Stork Amsterdam N.V., Amstelveen, Netherlands

Filed Apr. 2, 1970, Ser. No. 24,996
Int. Cl. B65g *17/16*
U.S. Cl. 198—145 **5 Claims**



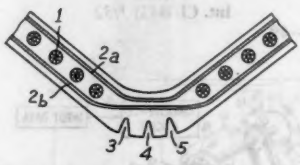
A conveyor for a treatment apparatus such as a hydrostatic cooker, said conveyor carrying swingably suspended receptacles for bottles, jars or the like containers. In order to keep the containers immovably in the receptacles, the latter have confining means consisting of at least one tiltable covering lath on top of the receptacle and vertical partitions within the receptacle, said partitions being positioned according to a specific configuration.

3,630,340

REINFORCED CONVEYOR BELTS

Henri Jacques Bouzat, Ferrand; Roland Joug, Nohanet, and Bernard Ragout, Clermont-Ferrand, all of France, assignors to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colomber, Colombes, France

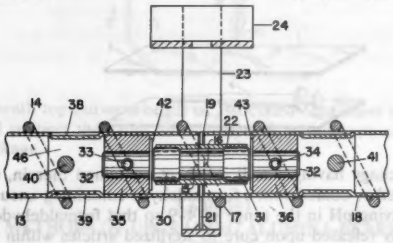
Filed July 7, 1969, Ser. No. 839,505
Claims priority, application France, July 8, 1968, 158388
Int. Cl. B65g *15/40, 15/34*
U.S. Cl. 198—201 **4 Claims**



This invention relates to reinforced conveyor belts, of the kind which are to assume a V-shape in use. According to the invention, a belt is provided with a reinforcement comprising a layer of parallel longitudinal elements interrupted in the central zone of flexure and also of two layers of parallel elements perpendicular to the axis of the belt, said latter layers being located on either side of the first-mentioned layer and

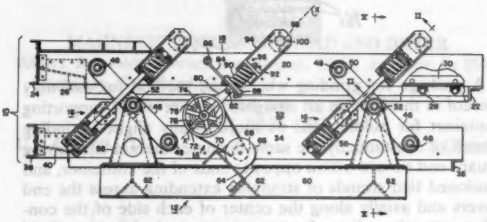
closely adjacent one another in the central zone of flexure that is not provided with longitudinal elements.

3,630,341
TRANSPORT CONVEYOR STRUCTURE
Steve Theodore Golden, 258 Banner Ave., Ventura, Calif.
Filed Jan. 12, 1970, Ser. No. 2,246
Int. Cl. B65g *33/00*
U.S. Cl. 198—213 8 Claims



A screw conveyor of the axially rotatable rail-type has cylindrical sections connected internally in end-to-end relation and with narrow transition gaps in the propelling screws of the sections at their junctions. A reversible motor drives the assembled conveyor sections which are supported by means of thin suspension members interposed between the ends of adjacent sections.

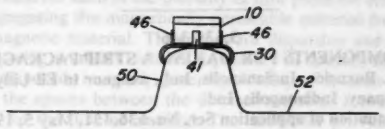
3,630,342
VIBRATORY OR RECIPROCATORY CONVEYOR OR SCREENING APPARATUS
Ostap Danyluke, 151 Ridgefield Road, Newtown Square, Pa.
Filed Nov. 20, 1969, Ser. No. 878,339
Int. Cl. B65g *27/00*
U.S. Cl. 198—220 AC 4 Claims



A vibratory conveyor or screening apparatus of the multiple, parallel deck type is provided with a set of damping devices each including a plurality of springs twice subjected to compression in response to movement of the deck members through each complete cycle of operation.

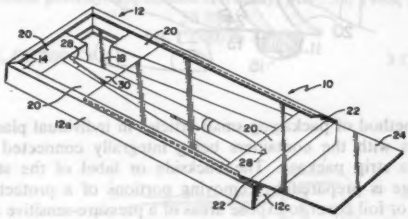
3,630,343
MULTIPLE CONTAINER HOLDER AND TISSUE DISPENSER HAVING A DETACHABLE SUPPORT MEANS
Benjamin Wohl, 11 Berndale Drive, Westport, Conn.
Filed Apr. 16, 1970, Ser. No. 29,198
Int. Cl. B60r *11/00*; B65d *83/00*
U.S. Cl. 206—19.5 R 7 Claims

A boxlike structure is provided having a removable lid with openings therein to accommodate the housing of a plurality of containers such as a tissue dispenser, a litter plurality of container, storage boxes, etc. A resilient C-shaped clamp has elongated resilient U-shaped members mounted thereon by a resilient clip which is adapted to receive and hold the boxlike member containing its multiple compartments. The mounting



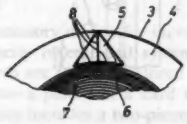
and retaining action of the C-shaped clip is particularly suitable for mounting the multiple container holder on top of the tunnel hump of an automobile.

3,630,344
BOX CONSTRUCTION
George G. Bergh, and Robert G. Bergh, both of North Attleboro, Mass., assignors to Bergh Bros. Co., Inc., Attleboro Falls, Mass.
Filed Aug. 22, 1969, Ser. No. 852,206
Int. Cl. B65d *25/10*, *43/12*
U.S. Cl. 206—45.14 3 Claims



A box construction including a wall member surrounding a first panel member. The wall member is provided with flanges extending inwardly on either side of the first panel member, the latter being held against one of the flanges by locating members. A second panel member is slideably inserted between the other of the flanges and the locating members. A second panel member cooperates with the wall member and the first panel member to fully enclose the interior of the box.

3,630,345
FILM SPOOL WITH A SUPPORT FOR THE ROLL OF FILM
Hans-Robert Schmidt, Cologne-Flittard, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed July 9, 1969, Ser. No. 840,298
Claims priority, application Germany, July 29, 1968, A 30183
Int. Cl. B65d *85/67*
U.S. Cl. 206—53 3 Claims



A film spool having an axial core and a radial flange at each end of the core is provided with camlike projections on the inner radial faces of the flanges. The projections are triangular in shape with an inwardly facing surface parallel to the core and an upper surface tapering from the flange so

that a strip wound in a roll on the spool is easily deflected inwardly of the flange and snaps under the projections.

The inwardly directed surfaces of the projections may be adapted to the curvature of the core surface.

3,630,346

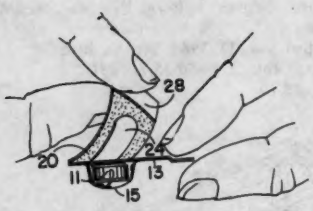
COMPONENTS FOR MAKING A STRIP PACKAGE

Carl B. Burnside, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of application Ser. No. 636,451, May 5, 1967, now abandoned. This application June 1, 1970, Ser. No. 42,527

Int. Cl. B65d *83/04*

U.S. Cl. 206—56 AB **3 Claims**



A method of packaging small articles in individual plastic blisters with the containers being integrally connected to form a strip package. The backside or label of the strip package is prepared by removing portions of a protective paper or foil cover to expose areas of a pressure-sensitive adhesive which is then positioned over the blisters to form the strip package.

3,630,347

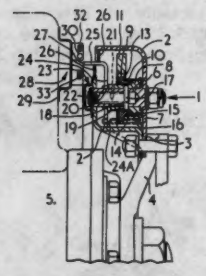
SKID-SENSING DEVICES

John Walter Davis, c/o Fort Dunlop Erdington, Birmingham 24, England

Continuation of application Ser. No. 722,964, Apr. 22, 1968. This application Oct. 16, 1970, Ser. No. 81,501

Int. Cl. H01h *29/02*

U.S. Cl. 200—61.46 **42 Claims**



A skid-sensing device for a vehicle antiskid braking system, comprising an annular flywheel mounted for rotation within an annular housing, the housing being arranged to extend coaxially around a rotatable drive shaft of a vehicle for rotation therewith, and sensing means responsive to overrunning of the flywheel, of which the following is a specification.

3,630,348

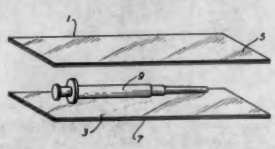
PACKAGE COMPRISING PAPER CONTAINING A FORMALDEHYDE RELEASING THERMOSETTING RESIN

Ronald L. Benson, Lunenburg; Christo Antonio, East Princeton, both of Mass., and John H. Brewer, Towson, Md., assignors to Fitchburg Paper Company, by said Benson and Antonio and Bicton Dickinson and Company, by said Brewer

Filed July 16, 1968, Ser. No. 745,308

Int. Cl. A61b *19/02*

U.S. Cl. 206—63.2 R **2 Claims**



A package having a wall, or sheet contained therein, impregnated or coated with a formaldehyde containing uncured resin having pH in the range of 4–9 so that formaldehyde is gradually released upon cure to sterilized articles within the package.

3,630,349

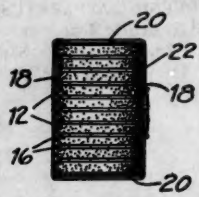
GRINDING WHEEL PACKAGE AND METHOD OF PACKAGING THEM

Franz F. Rechberger, Hamilton, Ontario, Canada, assignor to Norton Company, Worcester, Mass.

Filed Feb. 16, 1970, Ser. No. 11,386

Int. Cl. B65d *71/00*

U.S. Cl. 206—65 B **4 Claims**



A package for grinding wheels and method for assembly thereof in the form of an elongated square wheel supporting container for holding one or more axially aligned grinding wheels of substantially the same diameter therein and having square end covers within opposite ends of the container, and tensioned tied strands of strapping extending across the end covers and axially along the center of each side of the container opposite a line of contact between the inside walls of the container and the wheels. Disclosed also, is a method of packaging grinding wheels by stacking and centering them upon an end cover. A square container of sufficient length is slipped over the stack endwise and another end cover is placed over the exposed end of the stack of wheels to fit within the tube. Strapping is then stretched tightly across the outside of the end covers and along the center of each side of the container to force the wheels together and each side of the container into contact with the periphery of each of the wheels.

3,630,350

CONTAINER CARRIER PACKAGE

Herbert S. Bolton, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

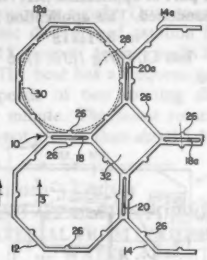
Filed Dec. 31, 1969, Ser. No. 889,500

Int. Cl. B65d *21/02, 71/00, 85/62*

U.S. Cl. 206—65 C **8 Claims**

A container package unit having an injection molded plastic carrier member including a plurality of integrally or

separably interconnected polygonal retainer elements forming an apertured skeleton framework with the sides of the retainer elements, or inward projections thereon, snapped



beneath top outward beads of associated containers to retain and support the same for transport as a multiunit container package.

3,630,351

METHODS OF UPGRADING ALUMINA-BEARING MATERIALS

Richard W. Uhinck, Columbia Station, Ohio, assignor to Gibbsite Corporation of America, Rochester, N.Y.

Filed Mar. 3, 1969, Ser. No. 804,023
Int. Cl. B03b *1/04*
U.S. Cl. 209—5 22 Claims

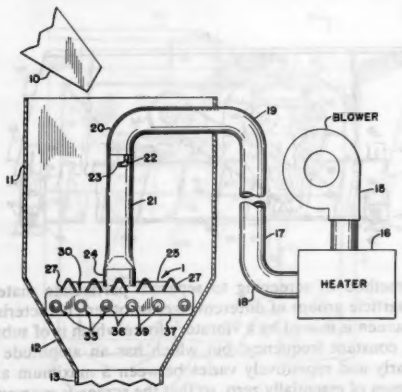
A continuous method of separating associated gibbsite ($Al_2O_3{}^{aq}{}^{3H}{}_2O$) from the siliceous material contained in gibbsite-bearing sands and alumina-bearing ores characterized by a reagent to a slurry of the raw material for the purpose of promoting separation and settling of slurrying the sand or ore with water and a reagent in an amount sufficient to cause separation of the siliceous material from the alumina and to permit settling of heavy siliceous material from the slurry. The reagent is selected from the group consisting of sodium hypochlorite, sodium pyrophosphate and ammonium hydroxide, and trisodium phosphate, wherein sodium hypochlorite is preferred.

3,630,352

MAGNETIC DISPERSION HEAD AND DRYER

Albert Reynolds Morse, Beachwood, Ohio, assignor to IMS Company, Cleveland, Ohio

Filed Nov. 4, 1968, Ser. No. 773,130
Int. Cl. B03b *1/02*
U.S. Cl. 209—11 2 Claims



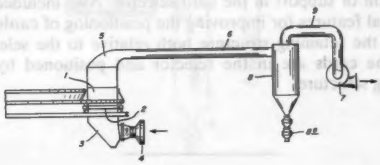
An apparatus is disclosed for drying a flow of granular nonmagnetic material which includes a low percentage of magnetically permeable contaminates to be segregated from the nonmagnetic material. The apparatus includes means for introducing heated air into each of a plurality of paths provided for the flow. Means are disclosed for providing a magnetic field for each of the plurality of flow paths for effectively segregating the magnetically permeable material from the nonmagnetic material. The means for dispersing and drying the flowing material includes a plurality of spaced, horizontally disposed, inverted, generally V-shaped diverter members, the spaces between the diverter members forming the paths for the flow of material. The means for providing the magnetic field includes a plurality of generally cylindrical permanent magnets in spaced axial alignment within each of a series of spaced parallel capped stainless steel tubes. Adjacent permanent magnets have like polarity juxtaposed to prevent bridging of the magnetically permeable particles across the flow paths between the tubes.

3,630,353

METHOD FOR SEPARATION OF FINES FROM HOT BROKEN SINTER

Horst Seidel, Biscofsheim, and Fred Cappel, Neu-Isenburg 11, both of Germany, assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Mar. 26, 1969, Ser. No. 810,628
Claims priority, application Germany, Mar. 30, 1968, P 17 58 081.3
Int. Cl. B07b *4/08*
U.S. Cl. 209—11 3 Claims



The invention is directed to the removal of granular fines or dust from broken sinter cake, before delivery thereof to a blast furnace, by subjecting the broken cake, during passage from the sinter breakers to the cooling area, to a pressurized upward blast of air which carries the sinter fines through an exhaust hood and suitable conveyor conduit into a precipitator which removes the fines for return to the sinter machine and discharges the air to the atmosphere.

3,630,354

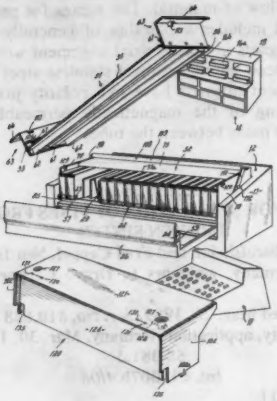
CARD STORAGE, TRANSFER AND POSITIONING DEVICE FOR USE IN CONJUNCTION WITH CARD RETRIEVAL APPARATUS

Richard C. O'Brien, Dayton, Ohio, assignor to OK Partnership, Cincinnati, Ohio

Filed Apr. 23, 1970, Ser. No. 48,572
Int. Cl. B07c *1/20*
U.S. Cl. 209—80.5 5 Claims

An improved accessory device for increasing the effective card storage capacity of retrieval systems in which edge-notched coded cards are randomly stored in face-to-face upstanding relation on a platen in a card selector apparatus. The accessory device includes a two-piece card tray having a substantially planar bottom panel against which the code-notched edges of the cards rest when stored face-to-face in a vertical disposition, and a retaining structure at least partially surrounding the upstanding cards. The retaining structure is positionable between engaged and disengaged positions relative to the bottom panel, thereby facilitating transfer of the

cards between the tray and the selector. The retaining structure, when engaged with the bottom panel, cooperates therewith to store the cards in the tray. Alternatively, and when the retaining structure is in the course of being positioned between its engaged and disengaged positions relative to the panel, the retaining structure functions to transfer the



cards between a position of support on the bottom panel and a position of support in the card selector. Also included are structural features for improving the positioning of cards and locking the retaining structure both relative to the selector, when the cards are in the selector and positioned by the retaining structure.

3,630,355

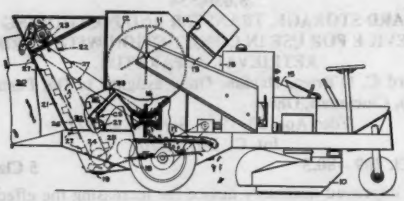
SUCTION CLEANING APPARATUS FOR DISCRETE CONVEYOR LOADS

William M. Christensen, Altamonte Springs, Fla., assignor to FMC Corporation, San Jose, Calif.

Filed May 15, 1969, Ser. No. 824,952

Int. Cl. B07b *4/08*

U.S. Cl. 209—137 **4 Claims**



A nut harvester has an elevator housing with a bucket conveyor therein. A suction duct has an inlet opening adjacent the conveyor. The conveyor buckets, which have vented bottoms, pass through a throat one at a time as they approach the duct inlet, and a flexible flap stretches over the bucket to define with the throat and bucket a chamber at the inlet opening through which debris from the bucket is drawn.

3,630,356

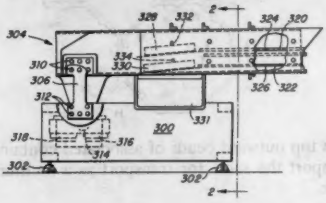
VIBRATING SCREEN WITH SPRING BEAM

Max Isaacson, 420 West Nottingham Road, Dayton, Ohio

Continuation-in-part of application Ser. No. 685,544, Nov. 27, 1964, now abandoned. This application May 2, 1969, Ser. No. 821,215

Int. Cl. B07g *1/30, 1/46*

U.S. Cl. 209—256 **2 Claims**



A separating and feeding means comprising a body mounted by spring beams to a base member, the body having a plurality of screens mounted thereon which separate larger from smaller particles, the screens being arranged in vertical separation from one another. Vibration-applying means are arranged to oscillate said body and screens about the virtual pivot axis of the spring beams to cause the particles to move linearly along the screen. In one embodiment a movable guide vane is mounted on the body to direct the flow of material from one screen to a discharge chute, with a similar guide vane being provided for the other screen or screens, said chutes being interconnected so that the same type of part can be discharged to the same physical location regardless of the relative sizing of the particles. In another embodiment an opening is provided through the lower section of the body and through the lower screen leading to a multiexit discharge chute, with a guide vane located within the chute to direct the particle flow selectively to an exit.

3,630,357

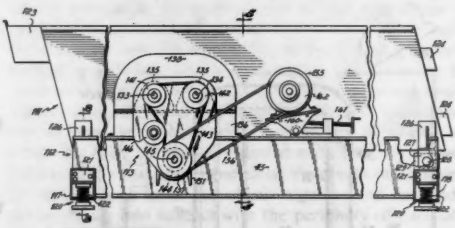
STOP MOTION SCREENING APPARTUS AND METHOD

Arthur C. Nolte, Cincinnati, Ohio, assignor to The Orville Simpson Company, Cincinnati, Ohio

Continuation-in-part of application Ser. No. 724,482, Apr. 26, 1968, now abandoned. This application June 17, 1969, Ser. No. 833,926

Int. Cl. B07b *1/38*

U.S. Cl. 209—326 **13 Claims**



A method of screening to separate particulate materials into particle groups of different sizes or other characteristics. The screen is moved by a vibratory force which is of substantially constant frequency, but which has an amplitude that regularly and repetitively varies between a maximum and a minimum of essentially zero, so that the screen is momentarily stopped at periodic intervals several times a minute. The vibratory force is desirably a reaction force established by two closely spaced unbalances masses rotating in the same direction but at slightly different rates. The reaction force

establishes a circular or elliptical motion, in the vertical plane, of points on the screen.

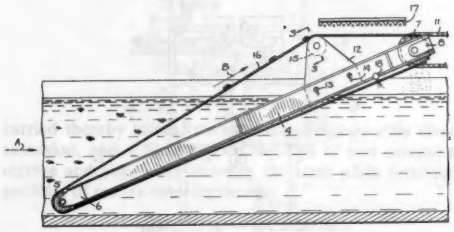
The apparatus includes a screen in a screen frame which supports a pair of closely spaced, centrally located shafts, each carrying an eccentric weight. Drive means rotate the eccentrics in the same direction of rotation but at rates that differ by about 1–15 percent. A beat results from the unequal rates of rotation. The beat has a frequency equal to the difference of the speeds of two rotating shafts, preferably 10–200 beats per minute. The faster rotating shaft should operate at a speed not greater than about 1,600 r.p.m.

3,630,358

METHOD AND APPARATUS FOR REMOVING SUSPENDED MATERIAL FROM UNDERGROUND MINE WATER

Frank E. Ralph, Butte, Mont., assignor to The Anaconda Company, New York, N.Y.

Filed Jan. 27, 1970, Ser. No. 6,247
Int. Cl. B01d *37/00*
U.S. Cl. 210—67 **7 Claims**



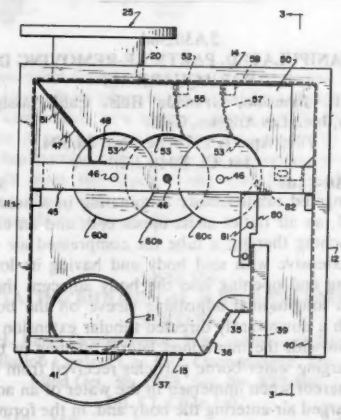
An apparatus and method is provided for continuously removing undesirable suspended material from a continuous stream of underground mine water by thermally decomposing the material to a residue and passing the residue back into the moving stream of underground mine water.

3,630,359

MULTIPLE-DRUM INTERCEPTOR

Pei Tai Pan, and Hugh McCauley Harper, both of Beloit, Wis., assignors to Fairbanks Morse Inc., New York, N.Y.

Filed July 25, 1969, Ser. No. 844,911
Int. Cl. B01d *33/06*
U.S. Cl. 210—73 **25 Claims**



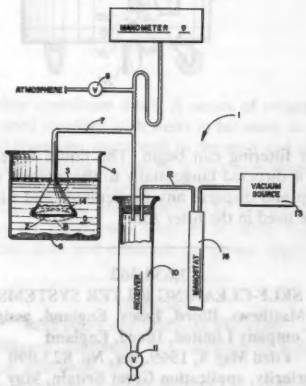
There is disclosed herein a novel system for the phased separation of the solid and liquid fractions of a solid-liquid sewage waste mixture disposed at a point contiguous to the point of origin of the mixture and between the point of origin and point of final treatment of the mixture. More particularly, there is provided a series of rotatable drum interceptors for intercepting and sequentially separating the solid fractions from the liquid fractions of a solid-liquid sewage mixture before substantial dissolution or disintegration of the solid fractions can occur whereby the resulting solid fractions are substantially separated from the liquid fractions and more readily disposed of separately from the liquid fractions.

3,630,360

FILTERING SYSTEM FOR FINE SUSPENSIONS

Noah S. Davis, Northridge; John B. Cramer, Palmdale, and Wilbur A. Lester, Rolling Hills Estates, all of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed Apr. 8, 1969, Ser. No. 814,305
Int. Cl. B01d *29/38*
U.S. Cl. 210—82 **2 Claims**



A relatively fine mesh flexible filter is placed in a container filled with a suspension of fine solids in a liquid. The liquid is forced through the filter by a relatively low differential pressure, such as an open container and a vacuum source. Before the filter becomes completely clogged by the solids, a small backflow is induced through the filter by reversing the pressure differential across the filter. The reverse flow causes the filter to flex so that the relatively thin layer of material is removed simultaneously. When using a vacuum system, this can be obtained by breaking the vacuum above the container to allow the small hydraulic head to back flush the filter. When the vacuum source is reconnected, the filtering process is resumed. This cycle is repeated until all the liquid has been filtered. In certain applications, the filtrate is the desired product, in others the filter cake, and in still others both the cake and the filtrate are required.

3,630,361

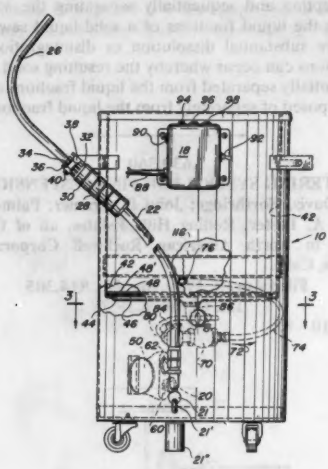
FILTER-MELTER FOR COOKING FAT

Richard T. Keating, 715 South 25th Avenue, Bellwood, Ill.

Filed June 27, 1969, Ser. No. 837,260
Int. Cl. B01d *35/16, 35/18*
U.S. Cl. 210—85 **7 Claims**

A combined filter and melter, for use with food fryers, having a heated circulatory and filter system adapted to remove used cooking fat from a fryer, subject it to a filtering, decolorizing and deodorizing treatment, and return the reconstituted fat to the fryer. Plugging of the circulatory system due to residual fat accumulations is prevented and makeup or new fat or shortening in solid form can be added and properly melted for ultimate return to the fryer. In one embodiment the conduits, pump and valves of the circulatory

system and the upstream side of the filter zone are provided with controlled heaters and means included to indicate when any solid fat in the system or filter zone is melted and circula-



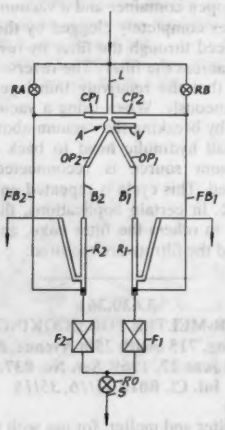
tion and/or filtering can begin. The liquid fat entering the filter zone is directed tangentially to the interior wall thereof to break up and disperse any particulate solid filter medium that may be used in the filter zone.

3,630,362

SELF-CLEANING FILTER SYSTEMS

Robert B. Matthews, Ilford, Essex, England, assignor to The Plessey Company Limited, Ilford, England

Filed May 8, 1969, Ser. No. 823,090
Claims priority, application Great Britain, May 23, 1968, 24,603/68
Int. Cl. B01d *29/38*
U.S. Cl. 210—108 **3 Claims**



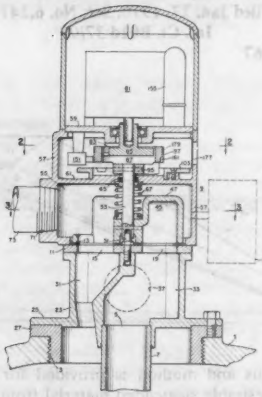
To ensure, by purely fluidic means, the alternate use of two filter units, one being in the main fluid path while the other is being reconditioned by back flushing with filtered liquid, two parallel branch paths are interposed between the main-flow inlet of a bistable fluidic device and a service outlet each branch including a filter and having a reverse-flow switch interposed between the bistable, which has two control jets, and the filter so as to conduct flow from the bistable to the filter but divert flow from the filter into a spill path, the switching of the bistable device being controlled by connecting the inlet of each control jet in parallel to the inlet of the appropriate filter and, via a restrictor to the fluid inlet of the system.

3,630,363

AUTOMATIC VALVE ASSEMBLY FOR SWIMMING POOL TYPE FILTER

Floyd M. Nash, and Joel T. Hicks, both of Little Rock, Ark., assignors to Jacuzzi Bros., Incorporated

Filed Aug. 7, 1969, Ser. No. 848,195
Int. Cl. B01d *23/24*
U.S. Cl. 210—108 **6 Claims**



An automatic filter valve assembly for a swimming pool type filter system, in which a rotary valve in pressure engagement with an orifice plate to provide a filtering position and a backwash position, includes means responsive to the accumulation of sediment in the filter, for raising the valve from its engagement with the orifice plate, rotating it to a backwash determining position, following which, a timing means, after a time period adequate for backwashing, restores the valve to its former filter position. Pushbutton means is provided for manually determining additional positions of the valve assembly.

3,630,364

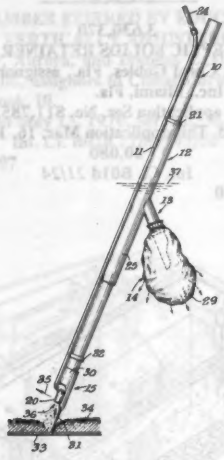
HAND-MANIPULATED, PARTICLE-REMOVING DEVICE FOR AQUARIUMS

Timothy B. Johnston, Granada Hills, Calif., assignor to Aquaria, Inc., Los Angeles, Calif.

Filed Apr. 1, 1970, Ser. No. 24,504
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **5 Claims**

An elongated tubular body terminating in a nozzle at its lower end, an air outlet at its upper end, and an elongated lateral opening therein; a tube for compressed air substantially coextensive with said body and having its lower air-discharging end opening into the body adjacent the nozzle thereof; a longitudinal adjustable sleeve on the body provided with a downwardly directed tubular extension in communication with the mentioned lateral opening in the body for discharging water-borne particles received from the nozzle end thereof when immersed in the water of an aquarium, the discharged air entering the body and, in the form of bubbles, percolating upwardly through the water in said body and, finally, venting from the upper end of the body; a longitudinally adjustable scraper fitting on the nozzle end of the

body for loosening accumulations of matter desired to be removed so particles thereof are buoyed upwardly and into the influence of the upwardly percolating air bubbles and



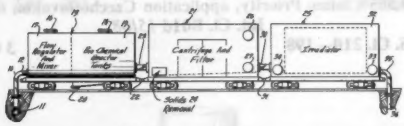
carried thereby toward the mentioned downwardly directed extension, and a filter bag on the end of said extension to receive and pass water entering the same while intercepting particles of matter entering therein.

3,630,365

TRANSPORTABLE LIQUID WASTE TREATMENT PLANT

David D. Woodbridge, Eau Gallie; Thomas A. Nevin, Indian Harbor Beach; William R. Garrett, Melbourne, and Leland A. Mann, Eau Gallie, all of Fla., assignors to Energy Systems, Inc., Melbourne, Fla.

Filed June 11, 1969, Ser. No. 839,136
Int. Cl. C02c *1/02*
U.S. Cl. 210—152 **7 Claims**



Transportable liquid waste treatment apparatus is adapted for movement from place to place and for temporary or permanent connection to a sewage system, or the like, for the treatment of sewage and other liquid waste. The basis apparatus has transportable means for converting and separating solids from the liquid waste and for irradiating the remaining fluid with a gamma radiation source prior to discharging the irradiated effluent.

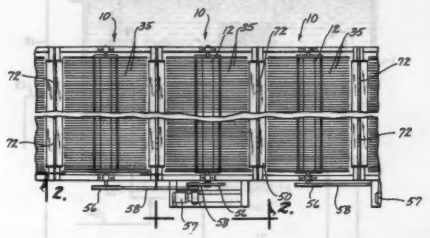
3,630,366

ROTATING BIOLOGICAL WASTE TREATMENT SYSTEM

Robert H. Joost, Oconomowoc, Wis., assignor to Environmental Pollution Control Co., Inc., Oconomowoc, Wis.

Filed Oct. 30, 1969, Ser. No. 872,609
Int. Cl. C02c *1/02*
U.S. Cl. 210—150 **10 Claims**

A rotary disc waste treatment unit having a semicylindrical tank into which liquid waste material is fed. An axial sleeve shaft has end plugs to which end plates are threadably bolted and which in turn carry stub shafts received in bearing supports on opposite sides of the tank. A plurality of radially extending channel members are provided with inner and outer bolt means extending through the channel members, end plates, styrofoam discs and alternately disposed styrofoam ring spacers; the inner ends of the channel members engaging the end plates while the outer ends are in mating contact



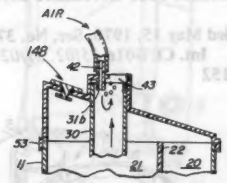
with the outer styrofoam discs. A series of rotary disc units may be secured together with weirs in between to control the flow of fluid from one waste unit to the next and all of the rotary disc units may be driven by a common motor at a low rate of speed to give maximum exposure of the waste material on the discs to the atmosphere. The styrofoam disc and spacer rings are sufficiently buoyant to offset the weight of the rotary disc units and minimize the power requirements.

3,630,367

BOTTOM AQUARIUM FILTER

Allan H. Willinger, Maywood, N.J., assignor to Aquariums Incorporated, Maywood, N.J.

Continuation-in-part of application Ser. No. 581,208, Sept. 22, 1966, now Patent No. 3,477,588. This application June 11, 1969, Ser. No. 832,172
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **11 Claims**



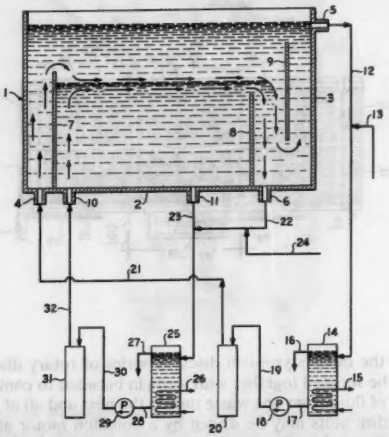
A bottom aquarium filter for an aquarium tank having contaminated and decontaminated water therein, said filter comprising in combination a container having an inlet compartment in fluid flow relation with said tank and a filtration compartment in fluid flow relation with said inlet compartment, said filtration compartment adaptable to contain a mass of filtering material and having a first opening for the ingress of air into said filtration compartment and egress of decontamination out of said filtration compartment, said inlet compartment having inlet means through which contaminated water from the tank may flow and venting means associated with said filter.

3,630,368

CONTINUOUS SKIMMER APPARATUS

Sung Ki Lee, Niagara, N.Y., assignor to Hooker Chemicals Corporation, Niagara Falls, N.Y.

Continuation of application Ser. No. 786,950, Dec. 26, 1968, now abandoned. This application June 19, 1970, Ser. No. 48,938
Int. Cl. B01d 21/10
U.S. Cl. 210—181 8 Claims



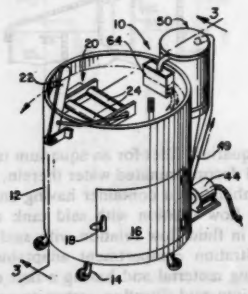
There is provided an apparatus for the continuous skimming of the interface of two phases therein comprising a housing having a bottom and at least one sidewall; weir means within said housing including one pair of overflow weir members of which the top of the first weir member is above the top of the second weir member; a first and a second outlet within said housing wherein said first outlet is in the upper region of said housing and said second outlet is in the lower region of said housing, and disposed such that said second weir member is between said first weir member and both said first and said second outlets; and a first inlet within said housing spaced apart from said first outlet and from said second outlet, and disposed such that said second weir member is between said first inlet and said first outlet.

3,630,369

MOP CLEANING DEVICE

Cecil Patrick Nichols, 5223 Devonshire Drive S.E., Washington, D.C.

Filed May 15, 1970, Ser. No. 37,569
Int. Cl. B01d 35/02, 21/02
U.S. Cl. 210—152 12 Claims



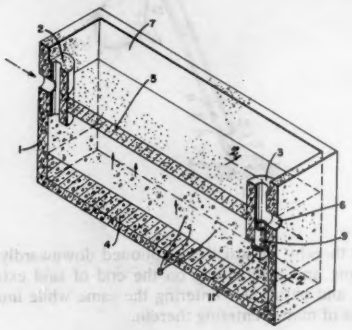
A mop cleaning device wherein a supply of cleaning fluid is circulated through a container while sediment is separated from the fluid. A sloped wall extends from an upper portion of the container to a lower portion thereof, with a discharge opening extending through the wall, whereby heavy sediment from the cleaning fluid is collected on the wall ,and discharged through the opening.

3,630,370

SEPTIC SOLIDS RETAINER

James K. Quina, Coral Gables, Fla., assignor to Royal Palm Beach Colony, Inc., Miami, Fla.

Continuation of application Ser. No. 811,785, Apr. 1, 1969, now abandoned. This application Mar. 16, 1970, Ser. No. 20,080
Int. Cl. B01d 21/24
U.S. Cl. 210—170 12 Claims



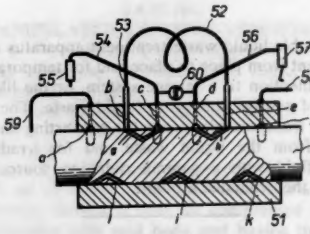
A septic solids retainer incorporated into a septic tank in such a manner as to retain solids by preventing the normal tank circulation from occurring within the outlet chamber.

3,630,371

VALVE MEANS FOR CHROMATOGRAPHIC APPARATUS

Jiri Hrdina, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation of application Ser. No. 498,034, Oct. 19, 1965, now abandoned. This application Aug. 4, 1969, Ser. No. 849,585 Claims Priority, application Czechoslovakia, 6171/64
Int. Cl. B01d 15/08
U.S. Cl. 210—198 3 Claims



Chromatographic apparatus including valve means for controlling flow through the apparatus. The valve means connects the carrier liquid, the sample liquid, the column and the pump and includes a housing with a rotary core. Passages are provided in the housing. These passages communicate with the various components of the apparatus. The rotary core of the valve includes passages communicating between pairs of passages in the housing. By selectively rotating the core from one position to another communication between

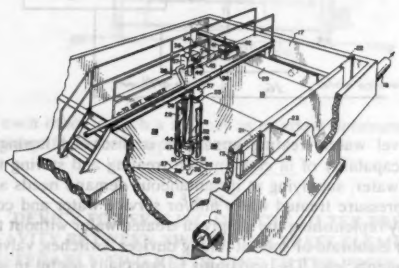
the housing passages can be altered to provide the desired flow paths.

3,630,372

GRIT CHAMBER STIRRED BY EDUCTOR TUBE ENCLOSING VERTICALLY ADJUSTABLE GRIT LIFT

Francis S. Weir, Aurora, and Douglas E. Dreier, North Aurora, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 13, 1970, Ser. No. 36,773
Int. Cl. B01d *12/00, 43/00*
U.S. Cl. 210—197 4 Claims



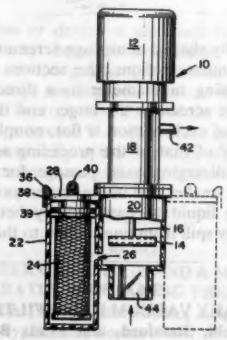
In a grit chamber the rolling action which allows selective settling of grit is maintained by a centrally located draft tube actuated by air liberation near the bottom thereof. Grit accumulating at the bottom of a hopper concentric with the draft tube is removed by an airlift extending along the axis of the draft tube and having its bottom section vertically adjustable to compensate for varying grit depth.

3,630,373

PUMP AND IMPELLER UNIT

Alfred E. Grazen, West Hartford, Conn., assignor to Electro-Metals, Inc., East Hampton, Conn.

Filed June 10, 1969, Ser. No. 831,932
Int. Cl. B01d *35/02*
U.S. Cl. 210—232 5 Claims



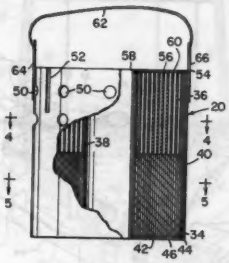
A pump and impeller unit which utilizes a double vaned impeller to eliminate the need for pump shaft seals, and also utilizing simple construction of filter cartridge assembly in relation to pump body to facilitate maintenance and replacement of the filter and the unit.

3,630,374

OIL FILTER CARTRIDGE

Joseph John Russo, 9191 Torresdale Avenue, Philadelphia, Pa.

Filed Oct. 8, 1969, Ser. No. 864,915
Int. Cl. B01d *29/06, 27/08*
U.S. Cl. 210—232 4 Claims



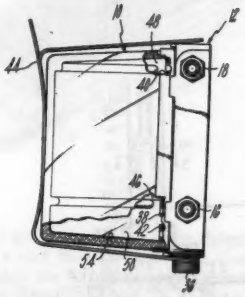
An oil filter cartridge including a coarse filter element and a fine filter element in vertically juxtaposed relation, each wound about a common central core and enclosed with a cylindrical cardboard cover, the said cover being provided with slits to permit easy insertion of the coarse and fine filter filtering elements and the said cover further being provided with openings to permit the passage of oil therethrough at predetermined locations.

3,630,375

THROWAWAY FILTER CARTRIDGE

David H. Hodgkins, Manchester, Conn., assignor to Stanadyne, Inc., Wilson, Conn.

Filed June 15, 1970, Ser. No. 46,213
Int. Cl. B01d *29/00*
U.S. Cl. 210—299 4 Claims

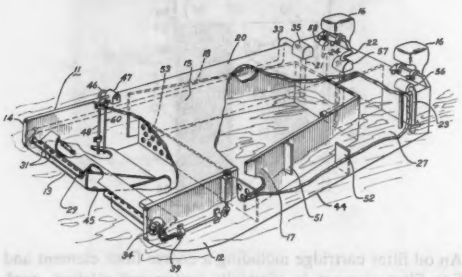


There is disclosed a throwaway fuel oil filter cartridge suited for vertical mounting having a base wall with three ported abutments. The upper one of the ported abutments communicates with the filter's outlet chamber and the other pair communicates with the filter's enlarged inlet chamber. The enlarged inlet chamber serves as a settling basin and a plenum chamber for incoming fuel, and one of the ports communicating therewith is positioned vertically below the other. The three ported abutments provide a tripod mount for the cartridge and the lower one serves as a drain for water which can be operated while the engine is running and prevents fuel line freezeup by maintaining the level of the water below the inlet passage to the filter.

3,630,375
OIL SLICK REMOVING VESSEL

Larry D. Price, 2656 S. Union, Blue Island, Ill.

Filed Nov. 3, 1969, Ser. No. 873,153
Int. Cl. E02b 15/04; B01d 21/24
U.S. Cl. 210—242 6 Claims

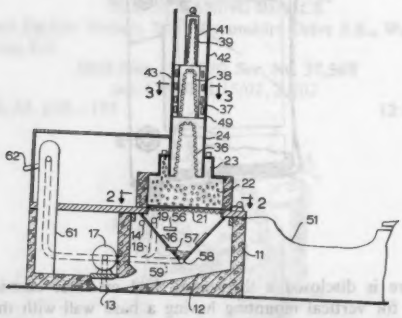


A vessel is disclosed for removing floating oil and other waste matter from the surface of water, such as from lakes, harbors, rivers or seas. An elongated pipe having a plurality of spaced slits for permitting water to flow therethrough is positioned along the forward portion of the vessel. A pump provides water under pressure to the pipe. Means for adjusting the pitch of the vessel and the depth at which the pipe is positioned are also provided.

3,630,377
SEWAGE FILTER UNIT

Frederick J. Brooks, San Rafael, Calif., assignor to Astrotronic Research, Ltd., North Vancouver, B. C., Canada

Filed June 11, 1969, Ser. No. 832,052
Int. Cl. B01d 23/10, 29/28
U.S. Cl. 210—152 5 Claims

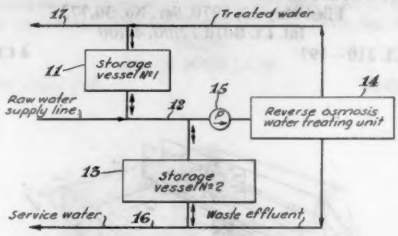


Sewage is delivered into a sump under sufficient pressure to counterbalance the hydrostatic pressure of a superimposed vertical series of filters. Water rises through the series of filters while the solids remain in the sump or are removed in the filters. An ultrasonic device destroys bacteria. The outflow of liquid is free of solid contamination and bacteria. Solid components from the sump are burned.

3,630,378
NOVEL WATER TREATING AND STORAGE APPARATUS

William C. Bauman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 24, 1968, Ser. No. 731,981
Int. Cl. B01d 31/00
U.S. Cl. 210—257 10 Claims

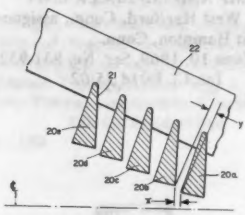


A novel water treating apparatus is disclosed having a unique capability of in combination treating and storing the treated water, supplying at instantaneous demand needs and at line pressure treated water and/or service water and continuously replenishing the supply of treated water without the need for elaborate or special timing devices, switches, valving arrangements, etc. The apparatus is especially useful in softening or desalting water by reverse osmosis, electrodialysis and the like.

3,630,379
STEP RING CENTRIFUGE SCREEN

Thomas Davy Sharples, Atherton, Calif., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 7, 1970, Ser. No. 61,885
Int. Cl. B01d 25/16, 33/00
U.S. Cl. 210—369 5 Claims



A frustoconically shaped centrifuge screen is formed from a plurality of annular sections, the sections being spaced, apart and increasing in diameter in a direction from the smaller end of the screen to the larger end thereof. The innermost surface of each section is flat, nonplanar with, and located outwardly of that of the preceding section so as to form a stepped diverging axial passage for a mixture introduced into the smaller end of the screen as it rotates about its axis, allowing liquid to pass radially between sections, while solids axially spill from one section to the next.

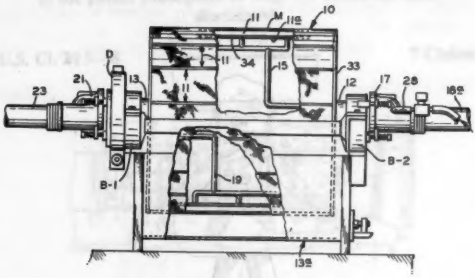
3,630,380
ROTARY VACUUM DRUM FILTERS

August C. Barnebl, Stamford, and Franz Bliem, Norwalk, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Aug. 28, 1969, Ser. No. 853,842
Int. Cl. B01d 33/06
U.S. Cl. 210—404 33 Claims

A rotary vacuum drum filter wherein the external filter compartments are provided with both leading and trailing fil-

trate drainage pipes, and separate vacuum control means are provided for each set of pipes, functioning and timed relative to each other in such a manner as to attain optimum filtrate drainage from the compartments.

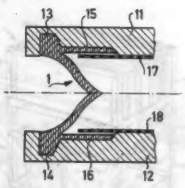


3,630,381

DEVICE FOR SEALING OFF THE FILTER PRESS CAVITY BETWEEN TWO FILTER PRESS ELEMENTS, PREFERABLY TWO REVOLVING FILTER PRESS BANDS OR BELTS OF A FILTER PRESS

Hans Gujer, Glattalstrasse 149, Rumlang, Zurich, and Karl Koller, Zurich, both of Switzerland, assignors to said Gujer, by said Koller

Filed July 1, 1969, Ser. No. 838,293
Claims priority, application Switzerland, July 7, 1968, 9846/68 Oct. 8, 1968, 14992/68
Int. Cl. B01d *33/04*
U.S. Cl. 210—400 **18 Claims**



An installation or device is disclosed for sealing off the filter press cavity between two filter press elements, preferably two revolving filter press bands of a filter press. Elastic sealing strips are disposed between the filter press surfaces at least at two opposite sides of the filter press cavity. The sealing strips have a V-shaped cross section with extensions pointing outwardly at the free ends of the shanks of the V, with the extensions engaging in suitable grooves in the sides of the filter press element.

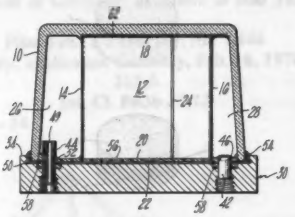
3,630,382

LIQUID FILTER CARTRIDGE AND A METHOD AND APPARATUS FOR MAKING THE SAME

David H. Hodgkins, Manchester, Conn., assignor to Standard Screw Company, Wilson, Conn.

Filed Mar. 10, 1969, Ser. No. 809,059
Int. Cl. B01d *27/06*
U.S. Cl. 210—443 **8 Claims**

An accordion pleated filter element is disposed in a cup-shaped housing and sealed to the adjacent walls of the housing dividing the interior thereof into an inlet and outlet. A cover plate, having ports communicating with the inlet and outlet, is bonded to the open end of the housing and the exposed side of the pleated element with a plastisol which covers the entire plate and extends through the ports.

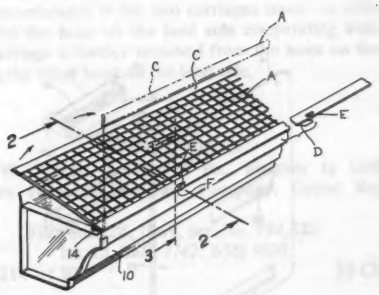


3,630,383

GUTTER GUARD

Charles H. Reeves, P.O. Box 11607, Northside Station, Atlanta, Ga.

Filed Dec. 16, 1969, Ser. No. 885,563
Int. Cl. B01d *23/00*
U.S. Cl. 210—474 **1 Claim**



A guard for a gutter having an outer flange extending inwardly toward a roof has a substantially U-shaped clip for locking same upon the flange, a looped member carried by an upper portion of the clip extending over the flange, and an aperture adjacent a hem carried by an elongated screen section forming a hinge for opening the gutter easily for cleaning.

3,630,384

FILTER BED ELEMENT FOR USE IN MELT-SPINNING

Haruhiko Toda, Mihara-shi, Japan, assignor to Teijin Limited, Osaka, Japan

Filed Oct. 8, 1969, Ser. No. 864,844
Claims priority, application Japan, Oct. 24, 1968, 43/77474
Int. Cl. B01d *39/00*
U.S. Cl. 210—506 **8 Claims**

A filter bed element for use in melt-spinning, which consists of a filter sand which has previously been molded using

as a binder a synthetic high polymer having a melting point equal to or lower than that of the synthetic high polymer to be filtered.

3,630,385

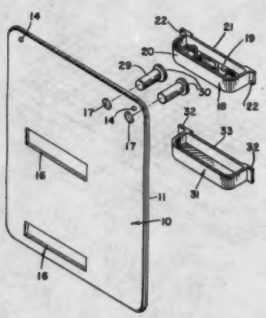
SUPPORT FOR TOOLS AND SMALL ARTICLES

Anne M. Searcy, Thomasville, Ga., assignor to Handy Anne, Inc., Thomasville, Ga.

Filed June 25, 1970, Ser. No. 49,840

Int. Cl. A47f 5/08

U.S. Cl. 211—88 **2 Claims**



A support for hand tools and small articles features a wall-mounted support panel and readily detachable tray and support elements which require no separate fasteners for attaching the same to the panel. The device knocks down readily for packaging.

3,630,386

ASH TRAY

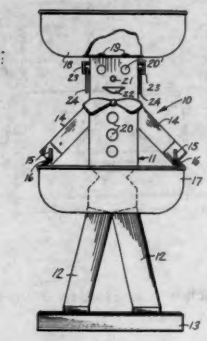
William V. Gale, and Joan L. Gale, both of 1309 Glenn, Pasadena, Tex.

Filed June 17, 1970, Ser. No. 46,954

Int. Cl. A47f 3/14

U.S. Cl. 211—133 **1 Claim**

A versatile and ornamental device for use as an ashtray, a nut bowl, a candy bowl or for use as a utility tray for holding jewelry or other articles. This device is of such construction so as to simulate a man having a bowl portion on top of the head and also a bowl portion being suspended from the arms, the bowls being used for any desired purpose.



3,630,387

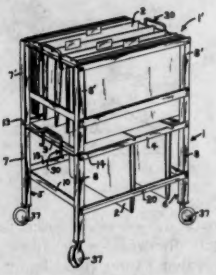
FILE SUPPORT STRUCTURE

Norvin J. Wehner, Kansas City, Mo., assignor to Cramer Industries, Inc., Kansas City, Mo.

Filed Feb. 16, 1970, Ser. No. 11,700

Int. Cl. A47f 5/10

U.S. Cl. 211—178 R **1 Claim**



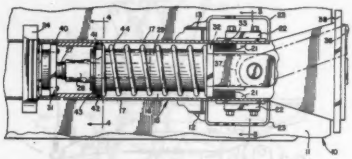
A collapsible file support structure for the vertical filing of file wrappers or similar objects wherein the collapsible file support structure has a pair of longitudinally spaced end frame members, each having a pair of upright members and rigid bracing members extending therebetween and a pair of laterally spaced longitudinal support bars extending between and having their ends pivotally secured to the upright members of each of the frames adjacent upper ends thereof. Locking bars extend parallel with the support bars and are pivotally secured at each end to the upright members of the frames spaced from the lower ends of the upright members, and fastening members secure the locking bars to the upright members whereby the file support structure may be selectively positioned in an upright position or a collapsed position. Roller means are mounted in lower ends of each of the upright members for movably supporting the file support structure.

3,630,388

CUSHIONING ARRANGEMENT FOR RAILWAY CAR

Willis H. Knippel, Palos Park, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 8, 1969, Ser. No. 883,087The portion of the term of the patent subsequent to Aug. 17, 1988, has been disclaimed.
Int. Cl. B61g 9/16
U.S. Cl. 213—8 7 Claims



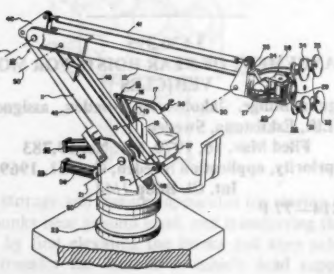
A railway car underframe includes at each end thereof an end-of-car cushioning installation including a hydraulic cushion which is movable between neutral, draft and buff positions during impacts on the coupler. The arrangement includes a cushion pocket having a piston rod anchored therein against longitudinal movement and includes a stop which in the buff position is engaged by a sliding collar slidingly supported on the cushioned cylinder and which is retained against the stop by means of a coil spring held captive on the cylinder. Under conditions of draft impact the cushioned cylinder during longitudinal movement compresses a plurality of spring leaves supported in the pocket and the collar is moved longitudinally away from the stop arrangement.

3,630,389

MATERIAL-HANDLING APPARATUS

George S. Schmidt, Schenectady, and Donald R. Wilt, Albany, both of N.Y., assignors to General Electric Company

Filed Sept. 30, 1970, Ser. No. 76,814
Int. Cl. B25j 3/02
U.S. Cl. 214—1 CM 5 Claims



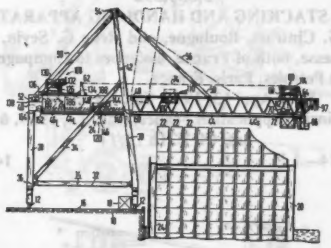
An articulated boom having an upper arm element and a lower arm element is secured to a support member at one end thereof to pivot about a first horizontal axis and has an end effector assembly at the other end thereof. The upper arm element and the lower arm elements are pivotally connected about a second horizontal axis. An intermediate member and a lower arm support member are provided for moving the lower arm element about the second horizontal axis. The intermediate member is pivotal about the first horizontal axis and the lower arm support member is pivotally connected at its ends to the lower arm elements and the intermediate member. An actuator pivotally connected between the support member and the intermediate member causes the upper arm element to swing about the second horizontal axis. Another actuator pivotally connected between the upper arm element and the support member pivotally swings the upper arm element about the first horizontal axis.

3,630,390

CONTAINER-LOADING CRANE ARRANGEMENT

Hans Tax, Potsdamer Strasse 3, and Rudiger Franke, 8 Munich 23, both of Germany, assignors to said Tax, by said Franke

Filed Feb. 2, 1970, Ser. No. 7,446
Claims priority, application Germany, Feb. 16, 1970, P 19 06 212.5
Int. Cl. B63b 27/12
U.S. Cl. 214—14 12 Claims



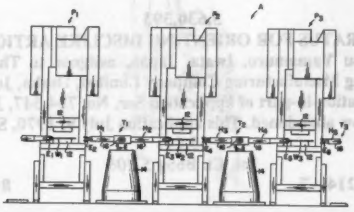
A crane for loading and unloading a containership and for transferring the containers between the ship and land vehicles is equipped with normally stationary hoists on the portions of its beam which are above water and above land respectively. The containers lifted by one hoist and lowered by the other are transferred between the hoists on the platform of a carriage traveling horizontally on the crane beam and automatically controlled by limit switches. Two carriages and two hoists on the land side of the crane can normally be served adequately by one hoist on the sea side of the crane without interference if the two carriages travel on different levels, and the hoist on the land side cooperating with the higher carriage is farther removed from the hoist on the sea side than the other hoist on the land side.

3,630,391

WORK GRIPPER

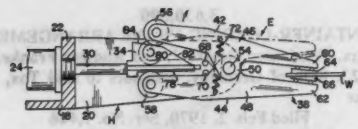
Walter W. Wilson, Levittown, Pa., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Jan. 28, 1969, Ser. No. 794,523
Int. Cl. B66c 1/42; B55j 9/00
U.S. Cl. 214—1 BB 13 Claims



A work handling assembly especially adapted for automated equipment comprising a movable arm, piston means supported on said arm, and removable cam means supported on the piston means, the arm including guide means for controlling the line of movement of said cam means. Also supported on the arm is a work engaging means including an ac-

tuating end and an opposed actuated end adapted to engage a workpiece; the actuating end being in line with the line of



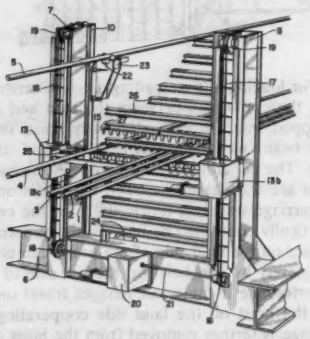
movement of said cam means and engaged thereby for controlled movement of the work engaging means actuated end.

3,630,392

ROD STACKING AND HANDLING APPARATUS

Bernard G. Cintract, Boulogne, and Rene G. Sevin, Garges-Les-Gonesse, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Apr. 13, 1970, Ser. No. 27,939
Claims priority, application France, Nov. 12, 1969, 6938751
Int. Cl. E21b *19/14*
U.S. Cl. 214—1 P **14 Claims**



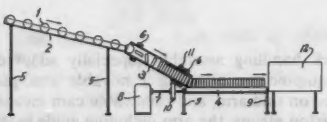
Apparatus for the stacking and withdrawal of horizontal rods, comprising a plurality of horizontally aligned finger bars for supporting the rods in horizontal relation, each of the finger bars having a free end, a conveyor for receiving a rod in the horizontal position and for moving it vertically to a position adjacent the free ends of selected bars and a pair of screw conveyors in horizontal alignment that are movable upwardly for engaging the rod and for moving it laterally onto the selected bars. The conveyors cooperate with spacing combs on the bars which maintain the rods in a predetermined spaced relation on the bars when the conveyors are moved away from the bars.

3,630,393

APPARATUS FOR ORIENTING DISCLIKE ARTICLES

Sadakatsu Yamamuro, Iwata, Japan, assignor to The Toyo Bearing Manufacturing Company Limited, Osaka, Japan

Continuation-in-part of application Ser. No. 734,347, June 4, 1968, now abandoned. This application July 9, 1970, Ser. No. 53,641
Int. Cl. B65g *57/08*
U.S. Cl. 214—7 **8 Claims**



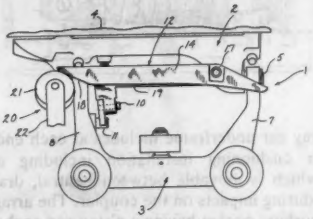
Apparatus for orienting disclike articles into a substantially straight line side-by-side relationship which includes an inclined rotating cylindrical tube through which the disclike articles pass in attaining the desired relationship.

3,630,394

CAM LEVER FOR ARTICLE HANDLING TRAY

Gary W. Kingzett, Milwaukee, Wis., assignor to A-T-O Inc., Butler, Wis.

Filed Oct. 22, 1969, Ser. No. 868,557
Int. Cl. B65g *47/38*
U.S. Cl. 214—62 A **3 Claims**



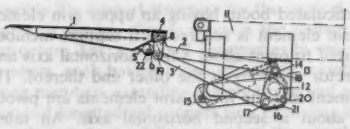
A conveyor carriage for a commodity sorting system that has a tray pivotally mounted to a supporting truck and a releasable latch mechanism that normally holds the tray in a horizontal load carrying position. A cam member is pivoted on the underside of the tray which includes two distinct inclined surfaces. The first surface is a short incline at the leading part of the member that is disposed at a relatively steep angle with respect to the direction of movement of the carriage, and the second surface presents a curve which has its leading portion tangential to the direction of movement of the tray and then descends in an increasing slope along the rest of its length. A tray tipping tilt arm is mounted in the path of travel of the carriage to engage the cam member and raise it for first releasing the latch mechanism, and then tilting the tray with a controlled acceleration that facilitates discharge of commodities from the tray.

3,630,395

ARRANGEMENT OF REAR HOISTS FOR MOTOR VEHICLES

Sten Magnus Bunge, Jakobsberg, Sweden, assignor to AB Hydro-Lift, Eskilstuna, Sweden

Filed Mar. 16, 1970, Ser. No. 19,783
Claims priority, application Sweden, Oct. 21, 1969, 14390
Int. Cl. B60p *1/44*
U.S. Cl. 214—77 P **6 Claims**



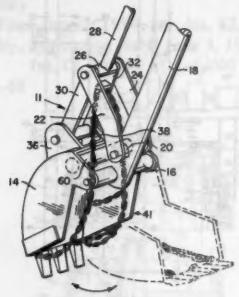
A hoist platform at the rear of a vehicle is mounted at the free ends of two pairs of arms forming a "parallelogram" linkage for raising and lowering the platform in a horizontal position. A linkage connected to the inner ends of one pair of arms causes the platform to tip down at ground level to facilitate loading. An adjustable cam is provided on the platform, the cam engaging the linkage, so that the platform can be made horizontal when the vehicle is on a slope.

3,630,396

SELF-CLEANING BACK HOE

Gerald W. Womack, 545 South "C" Street, Tracy, Calif.

Filed Feb. 5, 1970, Ser. No. 8,930
Int. Cl. E02f 3/00
U.S. Cl. 214—146 E 6 Claims



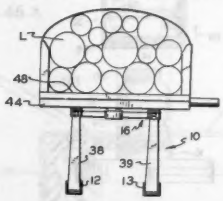
A chain arrangement is provided in operative association with a back hoe bucket and bucket-positioning mechanism in such a manner that the chain arrangement is positioned on the bottom of the bucket when scooping operations are being carried out and is propelled outwardly of said bucket when the contents of the bucket are being dumped.

3,630,397

SIDE SHIFTING STORAGE AND TRANSFER APPARATUS

Dossie M. Batson, Milwaukie, Oreg., assignor to Nelson Equipment Company, Portland, Oreg.

Filed Sept. 2, 1969, Ser. No. 854,590
Int. Cl. B65g 67/12
U.S. Cl. 214—146.5 11 Claims



A load storage and transfer apparatus for storing a load on transfer bunks near ground level, and transferring the load to a vehicle by first elevating the bunks and then side-shifting them to transfer the load to a vehicle load support. The transfer bunks are mounted for limited vertical tilting movement and for horizontal pivoting movement to facilitate transfer of the load to the vehicle and removal of the loaded vehicle from alongside the transfer bunks without clearance between the vehicle and transfer bunks.

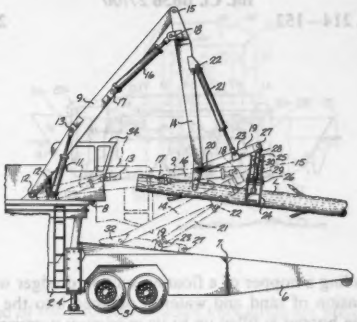
3,630,398

FULCRUM SPAR LOG CRANE

Peter J. Cervenak, Seattle, Wash., assignor to Nicholson Manufacturing Company, Seattle, Wash.

Continuation of application Ser. No. 600,871, Dec. 12, 1966, now abandoned. This application May 27, 1970, Ser. No. 41,708
Int. Cl. B66c 1/28
U.S. Cl. 214—147 AS 7 Claims

An articulated boom includes a main spar having one end pivotally mounted by a turntable for elevational swinging of an intermediate fulcrum spar having one end pivotally mounted on the swinging end of the main spar and its opposite end forming a log engaging fulcrum, and an auxiliary grab-mounting spar having one end pivoted to the fulcrum spar at a location spaced from its fulcrum end. A grab is pivotally mounted on the grab-mounting spar at a location spaced from the pivot connecting the grab-mounting spar and the fulcrum spar. The connected spars are swung relative to each other by fluid pressure jacks. The auxiliary spar is mounted on the upper and outer side of the fulcrum spar so that the three spars can be folded in zigzag relationship.

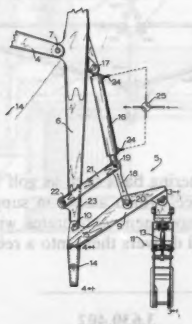


3,630,399

LOG LOADER WITH IMPROVED LINKAGE ARRANGEMENT

John R. Hanitz, Green Bay, Wis., assignor to Northwest Engineering Company, Green Bay, Wis.

Filed Dec. 18, 1969, Ser. No. 886,207
Int. Cl. B66c 1/44
U.S. Cl. 214—147 AS 5 Claims



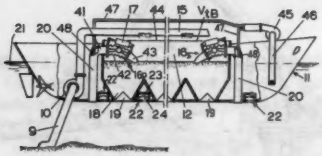
A logging machine has a boom with a log loader at its outer end. A grapple arm has a grapple and heel at opposite ends, and the end of the arm adjacent the heel is pivoted to a boom handle. A rectangular link structure includes at least a portion of the arm and handle, and also includes compression and tension links. The rectangular link structure is actuated to move the grapple and heel by a cylinder connecting the link structure with the boom handle.

3,630,400

METHOD OF LOADING A HOPPER OF A SUCTION DREDGER WITH SAND

Jan De Koning, Amsterdam, Netherlands, assignor to N.V. Ingenieursbureau voor Systemen en Octrooien "Spanstaal," , Binnenweg, Rotterdam, Netherlands

Filed Nov. 5, 1969, Ser. No. 874,212
Claims priority, application Netherlands, Nov. 8, 1968, 68.15921
Int. Cl. B63b *27/00*
U.S. Cl. 214—152 **2 Claims**



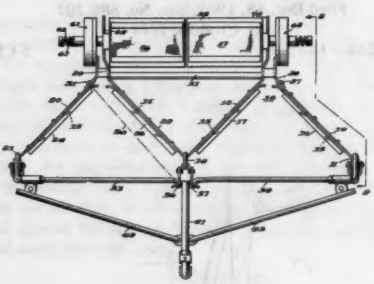
In loading a hopper of a floating suction dredger with sand a suspension of sand and water is pumped into the hopper. After the hopper is filled up to its maximum permissible carrying capacity in a first loading step additional suspension is pumped into the hopper in a second loading step during simultaneously draining off by lowering drain means in dependence on the weight of the load of the hopper for maintaining the suction dredger substantially loaded at its maximum permissible carrying capacity.

3,630,401

BALL RETRIEVER

August W. Gustafson, and Edna L. Gustafson, both of 350 Pasadena Place, Corpus Christi, Tex.

Filed July 6, 1970, Ser. No. 52,183
Int. Cl. B60p *1/00*
U.S. Cl. 214—356 **3 Claims**



Apparatus for gathering balls such as golf balls lying on a practice field. A wheel which assists in supporting the apparatus for rolling movement cooperates with a fixed disc and lifts the balls and delivers them into a receptacle carried by the apparatus.

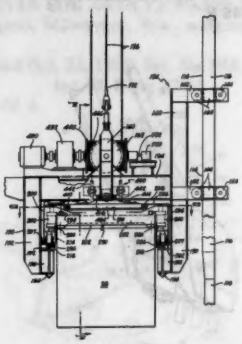
3,630,402

CRANE FOR HANDLING CONTAINERS

Robert R. Young, Danville, Calif., assignor to Kaiser Industries Corporation, Oakland, Calif.

Continuation-in-part of application Ser. No. 717,174, Mar. 29, 1968, now Patent No. 3,543,952. This application July 16, 1969, Ser. No. 842,158
Int. Cl. B66f *9/14*
U.S. Cl. 214—730 **15 Claims**

Apparatus for handling large heavy containers and similar loads and especially for transferring the same among the compartments of a vertical array of compartments and a separate transfer station and more particularly a crane for picking up and depositing such loads outside of a compartment, for inserting such loads into the compartments and depositing the same therein, and for picking up the loads within the compartments and removing the same therefrom.

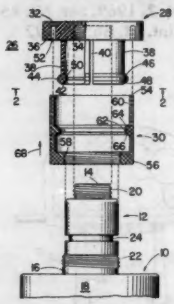


3,630,403

SAFETY CONTAINER CLOSURE

Robert C. Berg, 109 West 4th Street, Auburn, Ind.

Filed May 18, 1970, Ser. No. 38,265
Int. Cl. B61i *1/00;* **B65d** *55/02*
U.S. Cl. 215—9 **16 Claims**



A closure for a container having an elongated neck with first external threads adjacent its distal end and second external threads axially spaced from the first threads, the first and second threads having opposite hands. The closure comprises a cap member for closing the open end of the neck and having third internal threads for engaging the first neck threads. At least one resilient element is provided depending from the cap member in closely spaced relationship with the neck having a distal end spaced between the first and second threads. A locking member depends from the cap member in closely spaced relationship with the outer surface of the element, the locking member having fourth internal threads for engaging the second neck threads. The cap member receives a portion of the locking member so as to accommodate axial movement thereof between a first position with the fourth threads disposed intermediate the distal end of the element and the second neck threads, and a second position with the fourth threads engaging the second neck threads, and also to accommodate relative rotation of the cap and locking members. The locking member and element have cooperating locking means for inhibiting disengagement of the first and

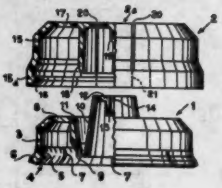
third threads and removal of the cap member from the neck when the locking member is in its second position.

3,630,404

CROWN CAP FOR A BOTTLE

Piergiacomo Guala, Alessandria, Italy, assignor to Angelo Guala Di Piergiacomo E. Roberto Guala & C.S.A.S., Alessandria, Italy

Filed June 2, 1970, Ser. No. 42,637
Claims priority, application Italy, June 3, 1969, 52098 A/69
Int. Cl. B65d *23/00, 53/00*
U.S. Cl. 215—40 **4 Claims**



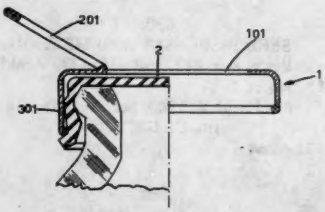
A two-piece crown cap with a flexible internal member that seals the neck of a bottle and a rigid external member that covers the internal member and holds it firmly in place. The external member has lines of weakness along which it is broken to give access to the internal member when the bottle is to be opened. Interfitting formations on the cap members cooperate during assembly to ensure sound sealing and a tight fit on the bottle.

3,630,405

DEVICE FOR RIPPING OFF METAL CROWN CAPS

Armando Podesta, c/o Vetri Industrial, via Eustachi, 52, Milan, Italy

Filed June 9, 1969, Ser. No. 831,671
Claims priority, application Italy, June 8, 1968, 7087-A/68
Int. Cl. B65d *41/42, 41/62*
U.S. Cl. 215—46 A **4 Claims**



A device for ripping of metal crown caps for closing containers, such as bottles, small glasses, pots or the like, comprises a ringlike grip member integrally formed on the crown cap bottom. The user introduces a finger into the gripping ring to exert a tension thereon for removal of the crown cap. Torsional stresses such as are experienced with known cap devices are thus avoided.

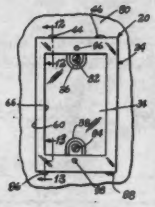
3,630,406

UTILITY BOX HOUSING CONNECTED TO A MOUNTING PLATE BY FLANGE AND TAB MEANS

Josef F. Hammes, St. Louis, Mo., assignor to Lowell Manufacturing Company, St. Louis, Mo.

Filed June 29, 1970, Ser. No. 50,633
Int. Cl. H02g *3/10*
U.S. Cl. 220—3.3 **4 Claims**

A utility box adapted to be mounted to the surface of a wall. The box provides an electrical outlet connection and is comprised of a back surface mounting plate adapted to be screwed to the wall surface without cutting into the wall. The mounting plate has a pair of tabs at one end and retaining flanges at an opposite end for interfitting with the box housing with the tabs fitting through opening at one end of the housing and the retaining flanges being screwed into the opposite end of the housing. Conduit knockouts are provided at the box so that the conduit may be fitted into the box and provisions are made for the connection of a faceplate to the box having any desired type of control switch through a simple screw connection of the plate to screw holes provided in the front of the box.

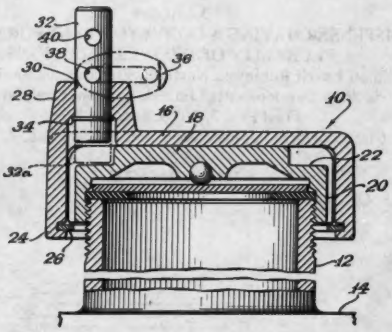


3,630,407

LOCKING FILLER CAP

John J. Mross, Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.

Original application Oct. 17, 1968, Ser. No. 768,262, now Patent No. 3,537,283. Divided and this application Mar. 16, 1970, Ser. No. 24,463
Int. Cl. B65d *51/18*
U.S. Cl. 220—29 **4 Claims**



A three-piece locking cap with disconnecting drive, which cap is adaptable to two uses or functions and which includes a filler cap, a separable outer cap, and drive-establishing means such as a locking pin having padlock openings therein. The cap has a nonlocked closure function provided by the filler cap only, and an interrupter-type locking function when the outer cap and locking pin are applied to the filler cap. The pin is selectively moved into drive-establishing position of interengagement between the caps, or padlocked to the outer cap in a drive interrupter or disconnecting position.

3,630,408

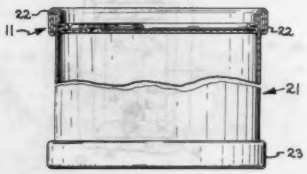
PROTECTIVE BEAD FOR A CONTAINER OPENING

William F. Elser, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Continuation of application Ser. No. 808,022, Mar. 17, 1969, now abandoned. This application July 21, 1970, Ser. No. 56,801

Int. Cl. B65d 17/20, 17/54

U.S. Cl. 220—54 4 Claims



This application discloses a metallic convenience closure of the full panel tear-out type for a container body, in which the closure upstanding sidewall which perimetrically surrounds the central closure panel is provided with an inwardly extending protective bead. This bead is spaced above and extends generally parallel to the closure central panel. The score line which circumscribes the removable portion of the closure panel is located entirely radially outwardly of the bead, and therefore the sharp edge which is formed along such score line when the removable portion is removed is in noncutting relationship with the hand of a person manually emptying the contents of the associated container. The closure is provided with a removal tab, the nose of which is located in the space between the closure panel and the protective bead. The protective bead also serves to radially stiffen the associated container, and a closure with such bead may be used to particular advantage with a semirigid container body, e.g., a composite, laminated container body deriving its strength principally from one or more cylindrically wound fiberboard plys or laminations.

3,630,409

DISPENSER HAVING A CONVEYOR BELT FORMING A PLURALITY OF DELIVERY SECTIONS

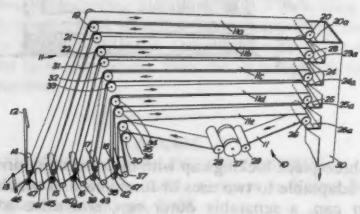
William Lovell Robinson, Northolt, England, assignor to Electric Shop Developments Limited, London, England

Filed Feb. 3, 1970, Ser. No. 8,296

Claims priority, application Great Britain, Feb. 4, 1969, 6,026/69

Int. Cl. B65h 7/04

U.S. Cl. 221—18 6 Claims



Apparatus for dispensing articles having a conveyor belt forming a plurality of delivery sections arranged such that only one delivery section at a time moves to dispense articles when the conveyor belt is driven.

3,630,410

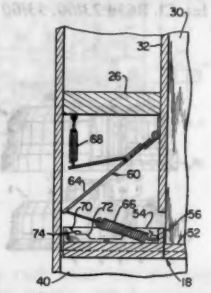
ARTICLE DISPENSER WITH PLURAL SPRING INTERLOCK

Robert E. Hendrickson, Carbondale, Colo., and William R. Slattery, Route 1, Box 139, Glenwood Springs, Colo.

Filed June 6, 1969, Ser. No. 831,026

Int. Cl. B65g 59/06

U.S. Cl. 221—125 3 Claims



Manually operated storage and dispensing cabinet for articles and packages characterized by a plurality of slidable drawers, each manually movable from a position beneath a stack or tier of articles or packages in the cabinet to a dispensing position outside of the cabinet, incorporating drawer interlock mechanism which permits only one drawer to be withdrawn at a time to its dispensing position during a manual operation, and a counter operated in response to movement of the withdrawn drawer; also incorporates a lock for each drawer which prevents its withdrawal after the last article or package resting on same has been dispensed, whereby the counter is precluded from recording in the event an attempt is made to withdraw an empty drawer which otherwise would effect an erroneous count of articles and packages actually moved to their dispensed positions.

3,630,411

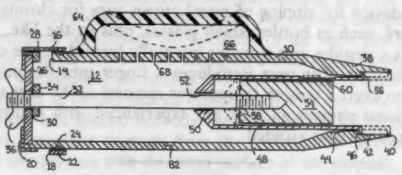
SEED DISPENSER AND METHOD

Clarence V. Petty, Box 272, and Alden G. Weakly, Box 264, both of Newport, N.Y.

Filed Sept. 8, 1969, Ser. No. 856,124

Int. Cl. G07f 7/00

U.S. Cl. 221—264 9 Claims



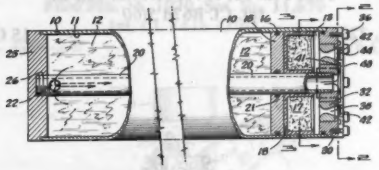
A device, operative in response to a pneumatic squeeze bulb, to select a discreet number of seeds and eject them under influence of a pneumatic ejection pressure. Also a sequential method of pneumatically positioning and ejecting a seed.

3,630,412

METHOD AND APPARATUS FOR GENERATING AEROSOLS

Erwin L. Capener, San Jose, Calif., and Lionel A. Dickinson, Accokeek, Md., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Apr. 8, 1970, Ser. No. 26,645
Int. Cl. B67b 7/00
U.S. Cl. 222—1 5 Claims



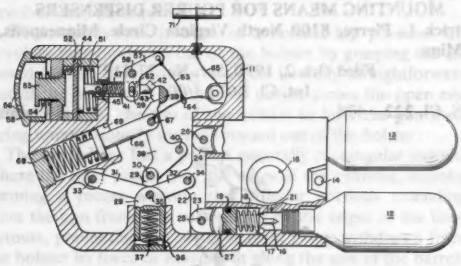
An aerosol is generated in the atmosphere by the use of a rocket wherein the internal pressure generated by combustion of a propellant is employed to force an aerosol-forming material carried within the rocket into contact with the stream of gases exiting from the rocket at velocities of at least Mach 1. The aerosol-forming material is injected through orifices into the said gas stream at pressures which are well above those prevailing in said stream at the injection point, thereby providing a high-pressure drop across the injector orifices.

3,630,413

DEVICE FOR MANUALLY OR AUTOMATICALLY INFLATING A LIFE PRESERVER

Orville L. Beckes, Washington, and Sherman E. Dare, Wheatland, both of Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed Apr. 1, 1970, Ser. No. 24,574
Int. Cl. B67b 7/24
U.S. Cl. 222—5 4 Claims



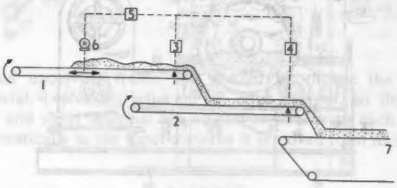
A device for manually or automatically puncturing one or more carbon dioxide cartridges for use in inflating a life preserver. A water-soluble disk is used to prevent movement of a spring-biased piston, and upon dissolving of this water-soluble disk, the spring-biased cylinder moves to withdraw a stop thereby permitting actuation of toggle linkage to drive one or more plungers which puncture one or more carbon dioxide cartridges. A one-way valve which is actuated by water pressure is provided to prevent high humidity or water spray from dissolving the water-soluble disk. A cable is also provided which can be used to actuate the toggle linkage to puncture the carbon dioxide cartridges.

3,630,414

DEVICE FOR FEEDING A BAKING APPARATUS FOR GREEN PELLETS

Paul Victor Parmentier, Grivegnee, Belgium, assignor to Centre National De Recherches Metallurgigues, Brussels, Belgium

Filed July 1, 1969, Ser. No. 838,246
Claims priority, application Belgium, July 3, 1968, 717,560
Int. Cl. G01f 1/00
U.S. Cl. 222—55 2 Claims



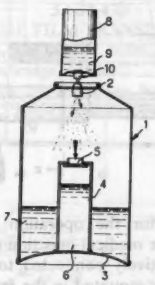
The invention relates to the feeding of baking apparatus with green pellets, for instance of iron ore, supplied by pelletizing apparatus the output of which may fluctuate. The green pellets coming from the pelletizing apparatus, optionally after screening, is fed to a movable belt conveyor discharging to a fixed belt conveyor which in turn discharges to the baking apparatus. Measuring apparatus measures the mass flow rates of the green pellets discharging from both conveyors. The movable conveyor is moved parallel to the conveying direction of the fixed conveyor at a velocity proportional to the difference between the mass flow rates so that the depth of the layer of green pellets on the fixed conveyor is approximately constant.

3,630,415

DEVICE FOR STORING A PLURALITY OF PRODUCTS SEPARATELY AND DISPENSING THEM SIMULTANEOUSLY

Bruno Morane, Paris; Charles Paoletti, Aulnay Sous Bois; Manlio Maurelli, Vaujours; Louis Merrien, Fontenay Sous Bois, and Robert Sathicq, Villepinte, all of France, assignors to L'Oreal, Paris, France

Filed Dec. 1, 1969, Ser. No. 881,079
Claims priority, application France, Feb. 7, 1969, 6902858
Int. Cl. B67d 5/56
U.S. Cl. 222—129 11 Claims

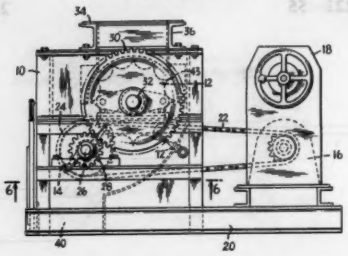


A device for storing a plurality of products separately and dispensing them simultaneously comprises an outer jacket, at least one fragile inner container and means for applying fluid pressure to said container to implode it.

3,630,416
ROTARY VOLUMETRIC FEEDING APPARATUS

Edward Bernard Weisselberg, Westwood County, and William Frederick Lamp, Bergen County, both of N.J., assignors to Wyssmont Company, Inc., Fort Lee, N.J.

Filed Feb. 5, 1970, Ser. No. 8,771
Int. Cl. B65d 3/00
U.S. Cl. 222—220 6 Claims

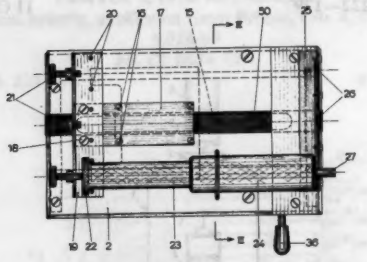


In rotary volumetric feeding apparatus, including a housing having openings for receiving and discharging material, a rotatable peripherally pocketed drum within the housing for feeding the material between the openings and an evacuation rotor for evacuating the pockets at a point adjacent the discharge opening, improvements are provided for spray cleaning the pockets, adjusting the clearances between the housing and the drum to accommodate materials of varying sizes, force-feeding material to the drum and for continuously maintaining the blades of wire-bladed evacuating rotors in a tightened condition.

3,630,417
MOTOR-DRIVEN FLUID-METERING DEVICE, IN PARTICULAR INFUSION PUMP FOR THE OPERATION OF ONE OR MORE HYPODERMIC SYRINGES

Hendrik Antoon Lorentz De Haas, Loenersloot, Netherlands, assignor to Berg & Burg N. V., Breukelen, Netherlands

Filed Mar. 18, 1970, Ser. No. 20,740
Claims priority, application Netherlands, Mar. 20, 1969, 6904268
Int. Cl. G01f 11/02
U.S. Cl. 222—333 10 Claims

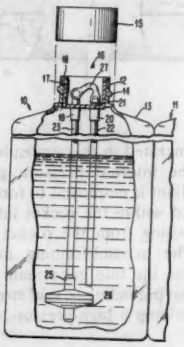


An infusion pump for the operation of one or more hypodermic syringes for medical injection purposes in which a slide member operatively connected to the syringes for discharging the latter is mounted in the frame of the device for movement between two end positions and is driven by an electric driving motor through a clutch and a speed reduction transmission which comprises a chain or rope drive having two wheels mounted adjacent both ends of the frame and two further wheels mounted on the slide member, and a chain or rope having its two ends secured to the two ends of the frame and passing from one frame end successively about one slide member mounted wheel, the frame-mounted wheel at this frame end, the opposite frame-mounted wheel at the other frame end, and the other slide member mounted wheel towards said latter frame end, one of the two frame mounted wheels being coupled to the clutch.

3,630,418
DISPENSER FOR SUPPLYING LIQUID BY SUCTION

Theodore Bilichniansky, Hopewell Jct., N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,548
Int. Cl. B67d 5/60
U.S. Cl. 222—464 15 Claims

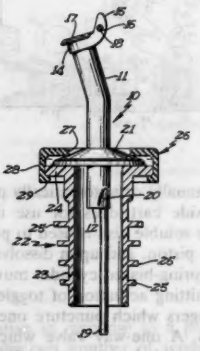


A dispenser including a container body having a mouth. A permanent liquid seal across the mouth has a pair of ducts approaching the bottom of the container and opening thereinto. The ducts extend upwardly through the seal, having their upper ends spaced apart. Before use, a short length of flexible tubing interconnects the upper ends of the ducts to prevent leakage and spillage. One end of the tubing may be disconnected and then connected to a suction inlet so that the connected one of the pair of ducts becomes an aspirating tube and the other provides an air inlet. Multiple container bodies may be supported together.

3,630,419
MOUNTING MEANS FOR POURER DISPENSERS

Patrick L. Pierce, 8100 North Virginia Circle, Minneapolis, Minn.

Filed Oct. 2, 1970, Ser. No. 77,419
Int. Cl. B67d 3/00
U.S. Cl. 222—478 5 Claims



A nonmetallic coupling member and a nonmetallic closure member are used to sealingly mount a conventional metal

pourer dispenser in the neck of a bottle. The closure member is tubular and has radial bottle-engaging elements thereon for sealingly engaging the inner surface of a neck of a bottle. A coupler member is releasably clamped to the closure member and pourer dispenser to permit liquid to be dispensed through the pourer dispenser.

3,630,420

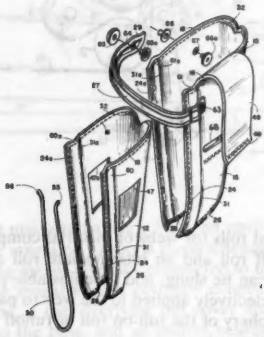
HOLSTER

John E. Bianchi, Bradbury, Calif., assignor to Bianchi Leather Products, Inc., Monrovia, Calif.

Filed Feb. 16, 1970, Ser. No. 11,679

Int. Cl. F41b *13/04*

U.S. Cl. 224—2 B **6 Claims**



This disclosure involves an open-front holster for revolvers including an inner liner and an outer facing which encase the barrel and cylinder portions of the revolver. The facing and liner portions extending along the sides of the barrel are joined together at their ends to enclose the tip of the muzzle. The facing and liner edges extending along each side of the barrel and chamber are separately jointed to retain the respective legs of a U-shaped spring, so that the base of the spring is adjacent to the tip of the revolver barrel and the ends of the spring legs are adjacent to the chamber, thereby forming a spring-supported slot along the length of the barrel and chamber through which by deflection of the spring the revolver may be drawn.

When the holster is worn in a normal hip position, the revolver may be drawn out of the holster by grasping the exposed handle and moving the gun laterally straightforward out of the holster. A safety strap passes across the open end of the slot near the top of the holster to hold the gun from being unintentionally moved forward out of the holster.

The inner liner has a pair of generally rectangular cutouts where the liner passes over the sides of the cylinder, thereby forming a recess wherein the cylinder portions extending from the gun frame are surrounded by the edges of the liner cutouts, preventing the revolver from being withdrawn from the holster by force or movement along the axis of the barrel.

3,630,421

DISPENSING DEVICE FOR ROLLED SHEET MATERIAL

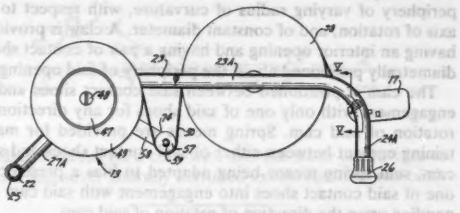
Edward Waltz, Grand Rapids, Mich., assignor to The E. O. Bulman Manufacturing Company, Inc., Grand Rapids, Mich.

Original application Feb. 9, 1967, Ser. No. 614,874, now Patent No. 3,555,060. Divided and this application Sept. 15, 1969, Ser. No. 871,078

Int. Cl. B26f *3/02*

U.S. Cl. 225—21 **4 Claims**

The apron taper has a frame structure upon which a roll of sheet material is rotatably supported so that said material can be unwound from the roll and passed over a cutting edge mounted on the frame for separation of a portion of the material from the remainder of the roll. One or more rolls of tape having adhesive material thereon are rotatably supported upon the frame and guided to engage the sheet material, preferably adjacent an edge thereof, so that the tape and sheet material are caused to adhere to each other automatically as the sheet material is removed from its roll.



3,630,422

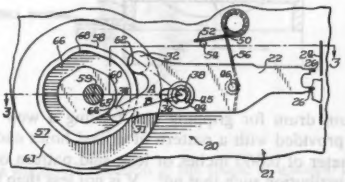
INTERMITTENT FILM MOTION MECHANISM

George F. Krtous, Chicago, and Edward G. Thurston, Urbana, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 14, 1970, Ser. No. 2,759

Int. Cl. G03b *1/22*

U.S. Cl. 226—62 **11 Claims**



An intermittent film motion mechanism having a shuttle with first and second cam followers on the shuttle, a film engaging member fixed to the shuttle, a cam engageable with the shuttle through the first and second cam followers, resilient means to continuously urge the shuttle against the cam, and a pivot pin for the shuttle located between the cam followers and the film engaging member. The cam has an outer cam surface with which the first cam follower is engaged, and a groove located interiorly of the outer cam surface, the groove having an inner cam surface with which said second cam follower is engaged, and the inner cam surface having a contour differing from said outer cam surface.

3,630,423

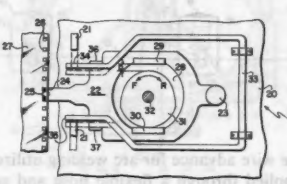
MOTION PICTURE FILM TRANSPORT MECHANISM

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1969, Ser. No. 888,228

Int. Cl. G03b *1/22*

U.S. Cl. 226—51 **21 Claims**



A reversible intermittent advance mechanism of the cam-claw variety is provided for use in cinematograph projection

apparatus. Means are provided for assuring that the claw is positively driven by the cam in both the forward and reverse projection modes.

Basically, the invention comprises a disc cam having a periphery of varying radius of curvature, with respect to its axis of rotation, and of constant diameter. A claw is provided having an interior opening and having a pair of contact shoes diametrally positioned about the periphery of said opening.

The cam is positioned between said contact shoes and in engagement with only one of said shoes for any direction of rotation of said cam. Spring means are provided for maintaining contact between either of said contact shoes and said cam; said spring means being adapted to bias a preselected one of said contact shoes into engagement with said cam depending upon the direction of rotation of said cam.

Reversal of the direction of advance is accomplished by adjusting the spring means so as to bring the other of said pair of contact shoes into engagement with said cam and by also reversing the direction of rotation of said cam.

3,630,424

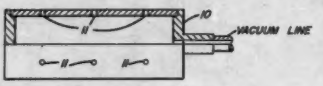
DRILLED NON-PORTED VACUUM DRUM

John A. Rau, Portland, Oreg., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 17, 1970, Ser. No. 46,946

Int. Cl. B65h *17/30*

U.S. Cl. 226—95 **9 Claims**



A vacuum drum for gripping and feeding a web has its periphery provided with a pattern of drilled holes each having a diameter of 0.060 inches or less, said pattern of holes having a distribution such that nd^2 V is not less than 0.05 or more than 0.15

where

d = hole diameter (inches)
n = number of holes per square foot of drum surface
V = vacuum measured with drum uncovered (inches of Hg).

Such a drum requires no porting and will accommodate webs of varying widths, some of which may not completely cover all holes in the drum surface.

3,630,425

ELECTRODE WIRE ADVANCE FOR ARC WELDING

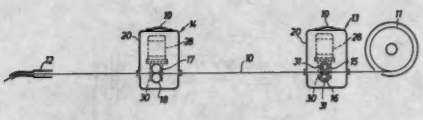
Gunter Wilkens, Kelkheim, Taunus, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Apr. 17, 1969, Ser. No. 816,984

Claims priority, application Germany, Apr. 20, 1969, P 17 65 255.4

Int. Cl. B65h *17/20*

U.S. Cl. 226—108 **5 Claims**



An electrode wire advance for arc welding utilizes an electrode wire supplied through a flexible hose and acted upon by two drives. One wire drive pushes or unwinds the wire and is connected thereto by a coupling. The other wire drive pulls the wire from its hose and pushes it to the torch.

3,630,426

TRAIN OF FEED ROLLS FOR PAPER, PLASTICS OR TEXTILE WEBS

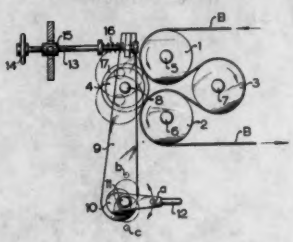
Herbert Rieger, and Friedrich Franz Brockmuller, both of Westphalia, Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Dec. 25, 1969, Ser. No. 879,840

Claims priority, application Germany, Dec. 2, 1968, P 18 12 226.4

Int. Cl. B65h *77/00*

U.S. Cl. 226—177 **10 Claims**



A train of feed rolls for webs of material comprises a run-on roll, a runoff roll and an intermediate roll about all of which the web can be slung, and an adjustable pressure roll adapted to be selectively applied to the web to pass the latter against the periphery of the run-on roll or runoff roll or both said rolls simultaneously.

3,630,427

RIVETING TOOL

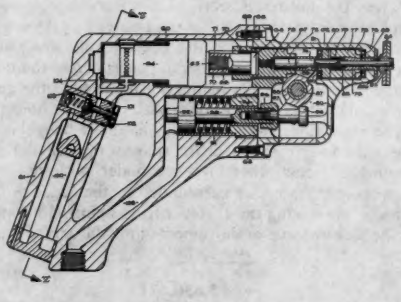
Kenneth J. Stokes, Kidderminster, England, assignor to G.K.N. Screws & Fasteners Limited, Smethwick, Warley, England

Filed Aug. 26, 1968, Ser. No. 755,313

Claims priority, application Great Britain, Aug. 10, 1968, 38,321/68

Int. Cl. B21j *15/18*

U.S. Cl. 227—59 **4 Claims**



A tool for use in a method of riveting two sheets together using a tubular rivet with an enlarged flange at one end and a mandrel having a shank and a head at one end of the shank with the head being provided with a drill point and comprising the steps of placing the rivet upon the shank of the mandrel and driving the mandrel so that its head pierces an aperture in the sheets to be joined, forcing the rivet into said aperture and then applying a retractive force to the mandrel to withdraw the mandrel and cause its enlarged head to ex-

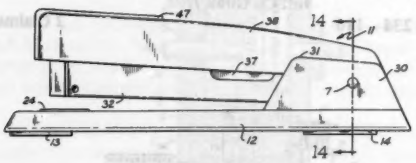
pand the end of the rivet radially outwardly. The tool comprises a body containing a collet for gripping the mandrel, a motor for rotating the collet to drive the mandrel and a pneumatic device to act upon the collet to provide retractive force for withdrawing the mandrel.

3,630,428

STAPLING MACHINE

Nathaniel M. Olney, New York, and John J. Power, Westbury, both of N.Y., assignors to Swingline Inc., Long Island City, N.Y.

Filed May 1, 1970, Ser. No. 34,213
Int. Cl. B25c *5/02*
U.S. Cl. 227—128 **13 Claims**



A stapling machine having a base, an anvil upon the base, an invertible magazine having a staple discharge opening and staple feeding means pivotally connected to the base, a cover overlying the magazine and pivotally connected to the base and magazine, a cap overlying the cover and also pivotally connected to the base, and an indicia bearing member connected to the cap. The anvil of the machine is supported within a recess provided in the base and is held firmly in downward position within the recess by one end of a leaf spring. The anvil is formed with chamfers on its leading and trailing edges and on its underside and provided with selectively engageable pinning and clinching portions. The magazine and associated structures are connected to the base by a pin passing through a pair of spaced ears which are each formed with upwardly and forwardly extending top portions and the topmost portion of each of the ears is in horizontal alignment with the staple discharge opening of the magazine when the magazine is in in inverted position on the base. Each of the ears also bears an inwardly and laterally extending portion adjacent the base which ears are abuttable with the sides of the magazine when the magazine is in normal position upon the base. Upon the pin which connects the magazine and associated structure with the ears there is a member formed with a pair of laterally disposed spacer elements thereupon which serve to space the magazine an associated structures from the sides of the ears and to prevent unwanted lateral movement thereupon. The indicia bearing member overlies fastening cap and is formed with fastening elements which connect with corresponding fastening elements of the cap.

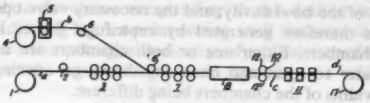
3,630,429

APPARATUS FOR PRODUCING COMPOSITE METALLIC WIRE

Yoshio Matsuda, and Shigenobu Ozaki, both of Itami-shi, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Original application Apr. 15, 1965, Ser. No. 448,411, now Patent No. 3,443,305, dated May 13, 1969. Divided and this application Mar. 24, 1969, Ser. No. 809,597
Int. Cl. B23k *21/00*; B23p *3/02*
U.S. Cl. 228—3 **9 Claims**

Apparatus to produce a composite wire wherein a pair of pressure bonding calibered rollers rotatably disposed adjacent one relative to another are provided to form at their point of tangential proximity pressure bonding, oppositely opposed concavities with conjugate concavities formed adjacently thereof, the former concavities to engage and circumferentially compress the outer deposited metallic



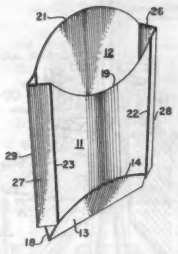
cladding material on a core wire and the latter concavities to receive and sever laterally extruded excess cladding material.

3,630,430

QUICKLY ERECTED SCOOP-TYPE CARTON

Glenn E. Struble, Fairfield, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,621
Int. Cl. B65d *5/36*
U.S. Cl. 229—16 B **6 Claims**



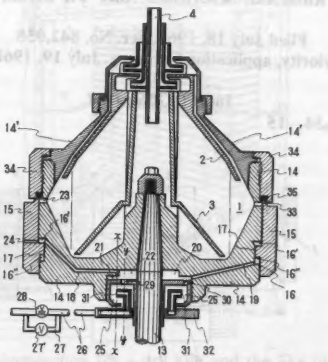
A box for quick erection in the shape of a scoop made with application of glue in parallel strips parallel to the blank edges and with an arcuate bottom having curved score lines and tapered sides to the box in assembled form.

3,630,431

VALVE-DISCHARGE DISC CENTRIFUGE

Yoshinori Oka, Yokohama, and Ryuichi Takahashi, Tokyo, both of Japan, assignors to Mitsubishi Kakoki Kaisha Ltd., Tokyo, Japan

Filed Mar. 10, 1970, Ser. No. 18,228
Claims priority, application Japan, June 18, 1969, 44/47637
Int. Cl. B04b *11/00*
U.S. Cl. 233—20 A **7 Claims**



The solids discharge openings in the radially outermost wall of a disc centrifuge bowl can be opened and closed by

means of a valve ring axially moved by hydraulic pressure in annular chambers separated in a circumferential groove of said outermost wall by a collar on the valve ring. The chambers are about as far from the axis of rotation as the farthest portion of the bowl cavity, and the necessary valve operating force is therefore generated by centrifugal forces in very small chambers. Either one or both chambers are supplied with water to open and close the discharge openings, the radial widths of the chambers being different.

3,630,432

APPARATUS FOR SEPARATING A LIQUID MIXTURE

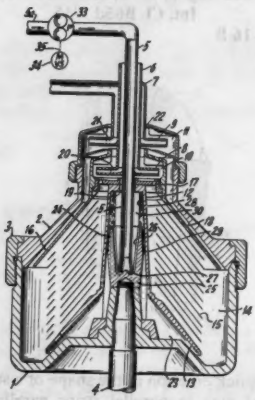
Jakob Murkes, Bandhagen, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed June 3, 1969, Ser. No. 829,858

Claims priority, application Sweden, June 6, 1968, 7575/68

Int. Cl. B04b *11/00*

U.S. Cl. 233—45 **1 Claim**



The liquid mixture to be separated, such as oil and water, is supplied by a rotary displacement pump having a variable speed drive for controlling the supply rate, and the mixture entering the pump is supplied in its entirety to a centrifugal separator having an inlet arranged to bring the supplied mixture into rotation by means of a smooth surface of revolution concentric to the rotation axis of the separator. In this way, the apparatus avoids the risk of breaking the liquid droplets of the mixture and thereby impairing the separating effect.

3,630,433

PUNCHED TAPE-CONTROLLED CARD PUNCHER

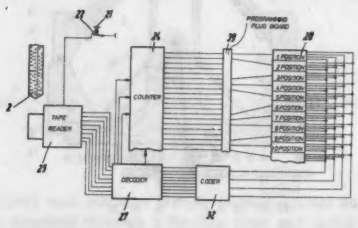
Gerhard Ritzerfeld, Schorlemer Allee 14, Berlin, 33, Germany

Filed July 18, 1969, Ser. No. 842,958

Claims priority, application Germany, July 19, 1968, P 17 74 580.1

Int. Cl. G06k *1/18*

U.S. Cl. 234—15 **9 Claims**



A card-punching arrangement in which information stored on punched tape is transferred to lines of a card punched by a card puncher. Signals from a tape reader are applied to a coding circuit for translating the code from the tape into a code suitable for recording on the card. A counter with forward and reverse counting features is connected to a card puncher by way of a programmable selector in the form of a plugboard to facilitate variation in the program. The information stored on the tape and recorded on card stock may include all of the symbols found on the conventional keyboard of a typewriter.

3,630,434

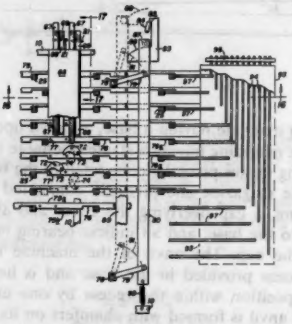
VOTING MACHINE WITH PUNCH CARD ATTACHMENT

Cothburn M. O'Neal, Arlington, Tex., assignor to AccuVote International, Inc.

Original application May 27, 1968, Ser. No. 740,415. Divided and this application May 8, 1970, Ser. No. 35,671

Int. Cl. G06k *1/08*

U.S. Cl. 234—116 **2 Claims**



A compact, lightweight, manually operated voting machine with provisions for straight ticket, selective and write-in voting, and for choosing two or more candidates from a list of several running at large; with provision for recording each voter's choice on a punch card for computer counting, and including a mechanical counter automatically totaling the votes for each candidate for confirmation of the punch card count.

3,630,435

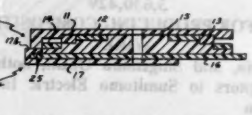
AEROTRACK, AIR-NAVIGATION TRIANGULATION COMPUTER

Jack B. Titus, 132 Elliott, Mather Air Force Base, Calif.

Filed May 25, 1970, Ser. No. 40,062

Int. Cl. G06c *27/00*

U.S. Cl. 235—78 **11 Claims**



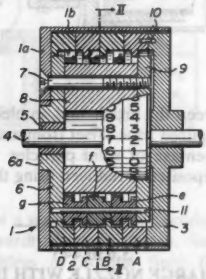
An air-navigation computer including a base disc element inscribed with a logarithmic scale, and movably mounted trig ring, compass indicator, combined master cursor and relative bearing indicator and wind direction pointer elements rotatably supported on the top surface of the base disc element. The compass indicator and wind direction pointer are slaved to the combined master cursor and relative bearing indicator, and a secondary cursor is rotatably mounted to the bottom of the base disc element.

3,630,436

MECHANICAL COUNTER

Manuel Claude Sanz, Grand-Lancy, Geneva, and Rene Weber, Geneva, both of Switzerland, assignors to Micromedic Systems, Inc., Philadelphia, Pa.

Filed Oct. 14, 1970, Ser. No. 80,705
Claims priority, application Switzerland, Oct. 17, 1969, 15537/69
Int. Cl. G06c *15/26*
U.S. Cl. 235—136 **13 Claims**



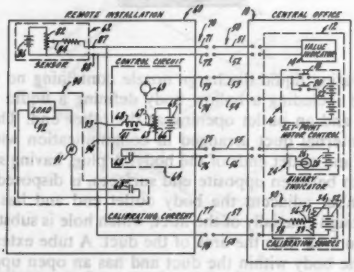
A mechanical counter capable of showing values changing continuously and at a high rate of speed, which comprises a series of numbered drums containing e.g. six groups of 10 figures moving angularly in front of a reading window. Each drum after the first has a toothed internal gear, and each drum preceding the last has a pair of circular cams for causing periodic movement of the subsequent drum and then locking it between movement periods. This transfer movement is effected by one of a series of gear means, mounted such that each gear means consists of a first gear continuously engaged with the toothed rim of a given drum, and second and third gears each having a pitch twice that of said first gear and having their teeth alternately aligned with teeth of said first gear, so that the second and third gears are alternately moved and locked by said pair of cams. Each cam has e.g. three arcuate projections, each projection of one cam being opposite an empty space of the other cam.

3,630,437

METHOD AND APPARATUS FOR REMOTELY CALIBRATING SENSOR INSTRUMENTS

James R. Swanson, Glenview, Ill., assignor to Powers Regulator Company, Skokie, Ill.

Filed Jan. 30, 1970, Ser. No. 6,985
Int. Cl. G05d *23/19*
U.S. Cl. 236—51 **3 Claims**



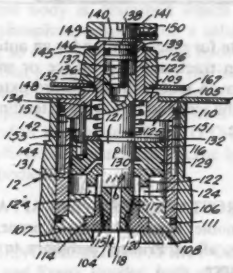
There is disclosed a method and an apparatus for carrying out the method for calibrating the set-point of a control system comprising a sensor for providing a signal indicative of a variable condition, and a control operable in response to departure of the variable condition from a setpoint, the method comprising the steps of: combining a calibrating signal with the sensor signal; adjusting the calibrating signal so that the total or resultant signal at the output to the sensor is equal to a value corresponding to the desired set-point value; adjusting the set-point setting until the control means provides an output signal indicative of equivalence of the set-point and the resultant signal and removing the calibrating signal.

3,630,438

ANESTHETIC VAPORIZER

Allan M. Bickford, Huntington Station, N.Y., assignor to The Foregger Company, Inc., Roslyn Heights, N.Y.

Original application July 20, 1965, Ser. No. 473,300, now Patent No. 3,420,232, dated Jan. 7, 1969. Divided and this application Sept. 17, 1968, Ser. No. 824,015
Int. Cl. F16k *25/00*
U.S. Cl. 236—93 **5 Claims**



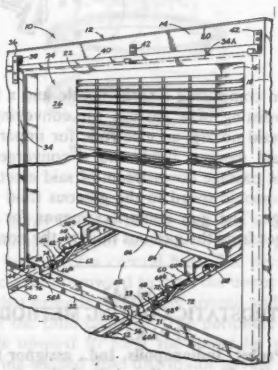
A gas control valve for an anesthetic vaporizer which compensates for temperature over a wide range to maintain a constant volume percentage of vaporized anesthetic in a fluid mixture despite changes in temperature or in rate of flow of the mixture.

3,630,439

TRACK CONSTRUCTION FOR DRY KILN

Franklin W. Cook, Portland, Oreg., assignor to F. W. Cook & Associates, Inc., Portland, Oreg.

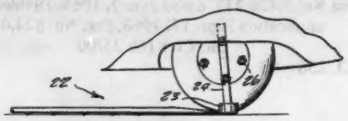
Filed Feb. 13, 1970, Ser. No. 11,059
Int. Cl. E01b *5/02*
U.S. Cl. 238—10 R **9 Claims**



Track construction for a dry kiln and the like including a pair of spaced-apart axially aligned stationary rails disposed on opposite sides of an access opening in the kiln. A movable rail is mounted on one of the stationary rails for swinging

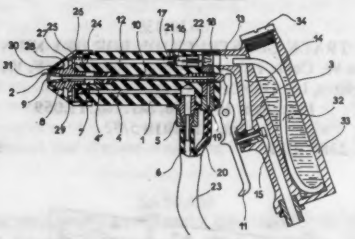
between one position fitted between the stationary rails, and another position overlying the one stationary rail. Such construction enables selective positioning of the movable rail to accommodate either movement of a lumber cart into and out of the kiln, or movement of a door into and out of a position closing and sealing the access opening.

3,630,440
EXTRACT-O-LIFTER
Ralf K. Sams, 10 Burbank Street, Yonkers, N.Y.
Filed Feb. 9, 1970, Ser. No. 9,843
Int. Cl. E01b *23/00*; B60t *3/00*
U.S. Cl. 238—14 **3 Claims**



A friction plate for placement under an automotive vehicle wheel so to gain traction when on ice or snow, the device comprising a woven mat with downward extending ice nails to hold against the ice, and upwardly extending nail heads for engaging the tire.

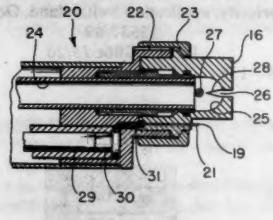
3,630,441
ELECTROSTATIC SPRAYING APPARATUS
Noel Felici, Grenoble; Roger Tholome, Corenc, and Felix Garcin, Grenoble, all of France, assignors to Tunzini-Sames, Grenoble, France
Continuation of application Ser. No. 797,996, Feb. 10, 1969, now abandoned. This application Oct. 30, 1970, Ser. No. 85,820
Int. Cl. B05b *5/00*
U.S. Cl. 239—15 **35 Claims**



A spray gun comprising a spray nozzle and a high-voltage generator consisting of a passage for conveying a gaseous fluid toward said nozzle, an electrode for imparting electric charges to said gaseous fluid, and a convergent-divergent portion in said passage downstream of said electrode for imparting a supersonic speed to the gaseous fluid carrying the electric charge. The gun comprises means for transmitting electric charges from the gaseous fluid to the nozzle.

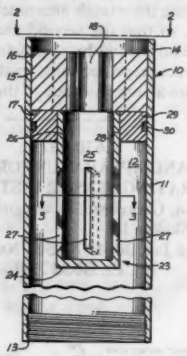
3,630,442
ELECTROSTATIC COATING METHOD AND APPARATUS
Richard O. Probst, Indianapolis, Ind., assignor to Randburg Electro-Coating Corp., Indianapolis, Ind.
Filed June 16, 1969, Ser. No. 833,401
Int. Cl. B05b *5/00*; F23d *11/28*
U.S. Cl. 239—15 **7 Claims**

A method and apparatus for electrostatically applying solid particles to an article employs a nozzle forming the solid particles into a pattern and directing them at the article, preferably in a relatively flat, fanlike spray. The forward portion of the nozzle is formed of insulating material and includes an ionizing electrode. An electrostatic field is



established between the article and an electrode that creates a single highly ionized zone offset from and rearwardly of the spray. The percentage of solid particles which are sprayed but remain undeposited is reduced using this method and apparatus.

3,630,443
LIQUID DISCHARGE NOZZLE WITH INVERTED CONE DISCHARGE PATTERN
John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corp., Burbank, Calif.
Original application Dec. 9, 1968, Ser. No. 784,541, now Patent No. 3,558,053, which is a continuation-in-part of application Ser. No. 691,111, Dec. 8, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 492,389, Oct. 4, 1965, now abandoned. Divided and this application July 6, 1970, Ser. No. 52,579
Int. Cl. B05b *17/08*
U.S. Cl. 239—17 **19 Claims**



An aerating liquid discharge nozzle containing no moving parts and including a hollow body defining a liquid inlet at one end and an outlet opening at the other end. The body has an internal duct arranged in communication with both the inlet and outlet ends of the body. A plug, having substantial length between opposite end surfaces, is disposed across the chamber adjacent the body outlet end and has a hole therethrough coaxially of the duct, which hole is substantially smaller in area than the area of the duct. A tube extends axially of the body within the duct and has an open upper end adjacent the plug, a closed lower end, and an inner chamber defined between the upper and lower ends of the tube. A plurality of slots extend through the sidewalls of the tube and are spaced apart around the circumference of the tube. Liquid introduced into the tube through the slots flow

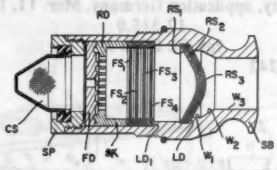
spirally around and along the interior of the tube to the plug hole and to the exterior of the nozzle through the hole.

3,630,444

TRAJECTORY FLOW CONTROL APPARATUS

Walter Raymond Nelson, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,246
Int. Cl. E03b *9/20*
U.S. Cl. 239—29 **8 Claims**



Covers a spout or a spout end which produces a trajectory stream, i.e., an upwardly directed stream, that is smooth and substantially splashless at normal fluid flow rates notwithstanding changes in the pressure of the fluid traversing the structure. The structure maintains the trajectory stream substantially smooth considerable splashless without the usual or conventional pressure regulator. The volume and path of the water can be maintained over an assigned trajectory path within a basin or lavatory.

The spout end includes a fluid control device consisting of two tandem arranged disks, one made of rubber and flexible, the other being a rigid disk made of plastic or metal. Structurally, the first disk includes a plurality of substantially identical cylindrical parallel apertures together with a considerable number of flexible projections. The second disk includes a greater number of substantially identical but smaller cylindrical parallel apertures.

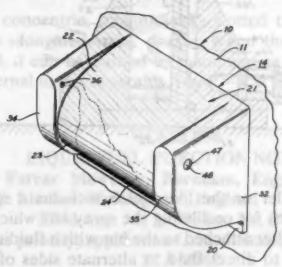
In addition to the two-disk structure, the mechanism also includes a conical disk upstream of the fluid control device, a plurality of flat screens downstream of the fluid control device, and a plurality of spherical or concaval screens downstream of the flat screens.

3,630,445

WALL-MOUNTED DRINKING FOUNTAIN

Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Fountain Company, Berkeley, Calif.

Filed July 23, 1970, Ser. No. 57,461
Int. Cl. E03b *9/20*
U.S. Cl. 239—29 **12 Claims**



A wall-mounted water fountain having a convex two-dimensional curvilinear surface area of generally parabolic configuration bordered at the ends thereof with raised ridges respectively provided with ports each of which is adapted to have a valve-controlled stream of water discharge therefrom. The trajectory of the water streams issuing from the ports causes them to impinge upon the upper section of the curvilinear surface which carries the water downwardly and through a drain opening located along the lower section of the surface and into a receiver disposed within the hollow interior of the fountain. Substantially all the functional components of the fountain are concealed within the hollow interior thereof so as to minimize the likelihood of vandalism and general misuse of the fountain.

3,630,446

INSECTICIDE-RELEASING SHAPED BODIES AND PROCESS FOR PRODUCING THEM

Willy Roth, Strengelbach, and Anna Elisabeth Keller, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 24, 1968, Ser. No. 786,553
Claims priority, application Switzerland, Dec. 29, 1967, 18371/67
Int. Cl. A61k *27/12*
U.S. Cl. 239—60 **8 Claims**

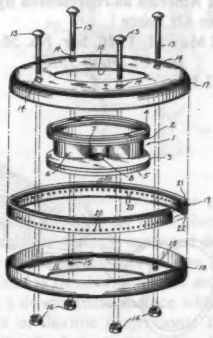
A shaped solid body is described which contains insecticidal organic phosphate adsorbed on a solid adsorbent, the adsorbate being so distributed in a solid hydrocarbon base of porous texture that a major portion of the insecticide can be gradually released in vapor form from the surface of the body into the surrounding atmosphere; a process for the production of such bodies is also described. O,O-dimethyl-0-(2,2-dichlorovinyl) phosphate is preferred as the insecticidal component in such bodies.

3,630,447

SEDIMENT-RESISTING SPRAY OUTLET

E. Allen Smart, and Frank Hessler, both of Wauwatosa, Wis., assignors to Bradley Washfountain Co., Menomonee Falls, Wis.

Filed Apr. 20, 1970, Ser. No. 29,897
Int. Cl. B05b *15/02*; **F23d** *11/34*
U.S. Cl. 239—107 **7 Claims**



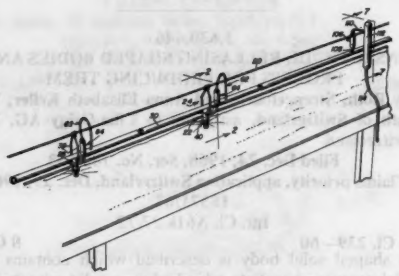
A circular spray head is shown that has a fluid chamber formed by clamping upper and lower dished plates against the top and bottom of a central hub. The periphery of the upper-plate curves downward to form the upper lip of an outlet opening that extends completely around and forms a part of the rim of the fluid chamber. The periphery of the lower plate extends upward to form the lower lip of this outlet opening. A ring-shaped fluid distributor having a plurality of successive, circumferentially spaced spray openings located along its length is inserted and maintained in the outlet opening. The fluid distributor is made of a resilient material which deforms slightly in response to fluid pressure to dislodge mineral deposits and keep the spray openings clean.

3,630,448

OVERHEAD SPRAY SYSTEM

Richard D. Chapin, 368 North Colorado Avenue, Watertown, N.Y.

Continuation-in-part of application Ser. No. 847,210, Aug. 4, 1969. This application Jan. 7, 1970, Ser. No. 1,158
Int. Cl. B05b *1/14*
U.S. Cl. 239—111 8 Claims



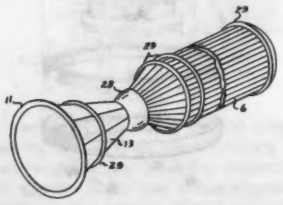
A watering system for long runs, normally greenhouse benches or the like, comprising an overhead installation including a tensioned suspension cable from which a series of support cradles are suspended by hangers. The support cradles seat an elongated water main across the aligned upper portions thereof in a self-leveling manner, and at the same time support a series of downwardly directed nozzles which in turn incorporate independent shutoff means. Each nozzle is communicated with the main through a valve which automatically terminates flow of water to the valve upon a drop in pressure below a predetermined point. A pressure-release valve is communicated with the main itself for effecting a fluid discharge therefrom and a pressure release upon a dropping of the pressure to a predetermined point.

3,630,449

NOZZLE FOR ROCKET ENGINE

Stanley D. Butler, Woodland Hills, Calif., assignor to The United States of America as represented by the Secretary of the United States Air Force

Filed May 11, 1970, Ser. No. 36,162
Int. Cl. B64d *33/04*
U.S. Cl. 239—127.1 1 Claim



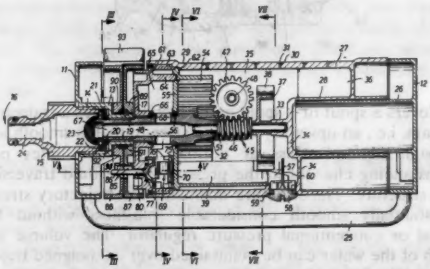
An improved structure and method of making are provided for cooling the conical nozzle of a rocket engine. The nozzle is constituted of a number of curved segments welded together along their side edges to form the cone member. In order to provide for cooling the metal of each segment, the latter is laid as a flat plate on the bed of a planing machine and by means of a gang-cutting tool, grooves are cut in the plate across its entire width. Thereafter a flat-facing sheet of metal is diffusion bonded to the grooved plate to leave closed channels across the plate composite. The plate is then curved to proper shape and the abutting edges are welded together so as to leave channels extending lengthwise of the member. These channels are made to coincide with similar channels formed along the combustion chamber. In the event of a jet engine powered by a mixture of gases, an auxiliary conduit is taken from one of the gas supply lines and forced through the channels for cooling purposes and finally returned to the source of the gas.

3,630,450

SPRINKLING APPARATUS

Christian Stephany, Erbach, and Johannes Katzer, Neu-ulm, both of Germany, assignors to Messrs. Kress u. Kastner GmbH, Ulm, Germany

Filed Mar. 2, 1970, Ser. No. 15,638
Claims priority, application Germany, Mar. 11, 1969, P 19 12 315.0
Int. Cl. B05b *3/16*
U.S. Cl. 239—242 32 Claims



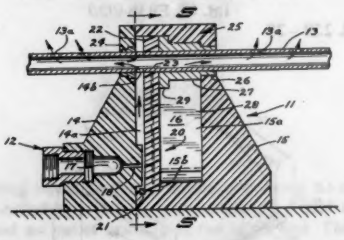
A sprinkling apparatus which has a very compact shape and comprises a turbine which is alternately rotated in opposite directions by the liquid to be sprayed and is located together with a reduction gearing and a control device for the turbine within a substantially cylindrical housing the peripheral wall of which is provided with spray nozzles and which is pivoted back and forth by the turbine and the pivoting range of which is freely adjustable manually.

3,630,451

FLUIDIC CONTROLLED SPRINKLER

James L. Farmer, Rte. 2, Box 381, Prior Lake, Minn.

Filed Aug. 13, 1969, Ser. No. 849,733
Int. Cl. B05b *3/16*
U.S. Cl. 239—242 6 Claims



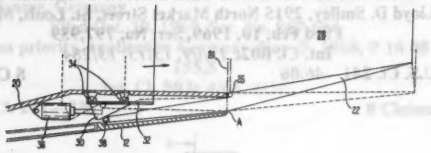
A fluid sprinkler or the like which includes a spray bar device with means for oscillating the spray bar which means includes an impeller attached to the bar with a fluidic control circuit arranged to direct fluid to alternate sides of the impeller and thereby control the motion of the spray bar. An inlet is provided for attaching the device to a garden hose or the like and a portion of the inlet fluid is utilized to control the impeller and the spray bar oscillation with the remainder of the inlet fluid passing directly into the controlled spray bar.

3,630,452

VARIABLE-AREA EXHAUST NOZZLES FOR GAS TURBINE ENGINES

William Thomas Monaghan, Sandiacre, Nottingham, England, assignor to Rolls Royce Limited, Derby, England

Filed Sept. 11, 1969, Ser. No. 856,942
Claims priority, application Great Britain, Sept. 14, 1968, 43,830/68
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.39 1 Claim



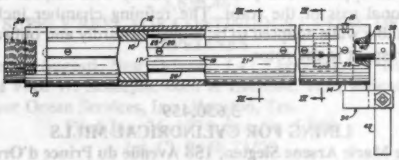
In a gas turbine engine, a variable-area exhaust nozzle is provided and consists of a plurality of flaps arranged in side-by-side sealing relationship with each other; each flap is hinged about the circumference of the downstream end of the engine in axially overlapping relationship therewith so as to permit rocking of the flaps such that their ends move about the axis of their respective hinges, cam means being provided to effect such rocking; the flaps are mounted so that their respective surfaces will form substantially continuous inner and outer flow surfaces.

3,630,453

ADJUSTABLE ELONGATED SPRAY NOZZLE

John R. Lane, and Kenneth A. Walley, both of Pittsburgh, Calif., assignors to United States Steel Corporation

Filed Feb. 20, 1970, Ser. No. 13,244
Int. Cl. A62c *31/00*
U.S. Cl. 239—437 3 Claims



Two concentric, longitudinally slotted tubes form an adjustable elongated spray nozzle. When the nozzle becomes clogged, it can be flushed by manipulating an adjusting handle external to the apparatus.

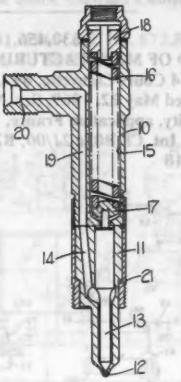
3,630,454

LIQUID FUEL INJECTION NOZZLES

Dorian Farrar Mowbray, Burnham, England, assignor to C.A.V. Limited, Birmingham, England

Filed Apr. 10, 1970, Ser. No. 27,246
Claims priority, application Great Britain, Apr. 24, 1969, 21,010/69
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 1 Claim

A liquid fuel injection nozzle having a cylindrical body and to which is secured a nozzle head, the nozzle head containing a valve member and being spring loaded by means of a sprong disposed within a bore formed in the nozzle body and further including a drilling through which liquid fuel can flow through the body to the nozzle head. In order to provide the maximum wall thickness for the drilling the axis of the bore is offset relative to the axis of the body.

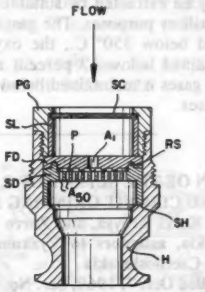


3,630,455

SPOUT END APPARATUS

Richard Grant Parkison, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,248
Int. Cl. B05b *1/30*
U.S. Cl. 239—535 19 Claims



Covers a fluid flow control device or pressure regulator suitable for a spout end structure for a plumbing fixture. The equipment includes two tandem arranged disks which may be inserted into the spout end structure. The first disk, which is made of rubber and is flexible, includes an upstream surface which is flat and a downstream surface which includes a considerable number of flexible projections. The first disk also includes a plurality of substantially identical cylindrical parallel apertures through which the fluid flows. The second or downstream disk, which is a rigid disk made of plastic or metal, includes a greater number of substantially identical but smaller cylindrical parallel apertures. The two disks are positioned closely adjacent to each other so that, in the absence of pressure or under low-pressure conditions, the projections on the first disk barely contact the adjacent surface of the second disk. As the fluid pressure applied to the first disk rises above a predetermined value or varies above that level, the projections on the first disk will be somewhat flattened and driven pursuant to the increased pressure against the second disk. Consequently, the flattening of those projections caused by increased pressure will proportionally reduce the fluid flow passageways so that fluid emission

through the second disk and through the spout end will remain substantially unchanged, notwithstanding the change or rapid rate of change of pressure of the applied fluid.

3,630,456

METHOD OF MANUFACTURING FIBERBOARD

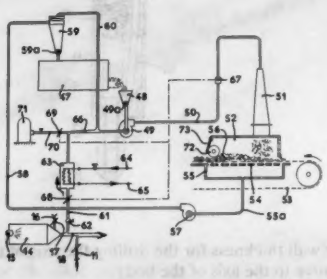
Andre Mark, 54 Cours Lafayette, 69 Lyon, France

Filed May 22, 1969, Ser. No. 826,994

Claims priority, application France, May 22, 1968, 50040

Int. Cl. B02c *21/00;* **B29j** *5/00*

U.S. Cl. 241—18 **3 Claims**



A relatively dry, oxygen-poor, heated fluid is provided for conveying wood fibers through the drying cycle subsequent to crushing the wood chips and for also conveying and distributing the wood fibers from the drying cycle onto a mat-forming wire. The primary source of the fluid is the combustion gases from a burner. Secondary fluids including ambient air, recirculated gases from the drying cycle and inert gases may be introduced to cool the fluid to the desired temperature and provide the fluid with the correct amounts of oxygen and water vapor. In reducing the temperature of the fluid, heat may be extracted by suitable heat exchanges and utilized for auxiliary purposes. The gases used in the process are maintained below 350° C., the oxygen content of the gases is maintained below 17 percent and the water vapor content of the gases is maintained below 100 grams per kilogram of dry gases.

3,630,457

REGULATION OF THE SUPPLY OF RAW MATERIAL TO A CLOSED CIRCUIT GRINDING MILL SYSTEM

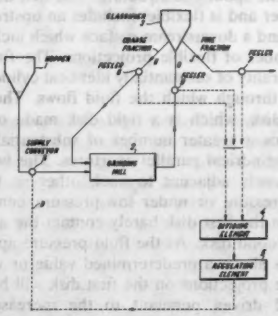
Ivan Forman; Karel Kreysa, and Zorro Vasicek, all of Brno, Czechoslovakia, assignors to Vyzkumny ustav stavebnich hmot, Brno, Czechoslovakia

Filed Oct. 7, 1969, Ser. No. 864,398

Claims priority, application Czechoslovakia, Oct. 24, 1968, 7321/68

Int. Cl. B02c *25/00*

U.S. Cl. 241—34 **2 Claims**



The amount of raw material, supplied for grinding to a closed-circuit grinding mill system, comprising a device for feeding the raw material to the grinding mill, a classifier of the ground material, structure for returning coarse material to the grinding mill for repeated grinding, and the respective conveying tracks for the treated material, is adjusted in dependence on the ratio of the weight amount of the fine output from the classifier and of the weight amount of the coarse material returned from the classifier for repeated grinding, whereby the amount of raw material supplied is limited in dependence on a predetermined maximum content of the grinding mill.

3,630,458

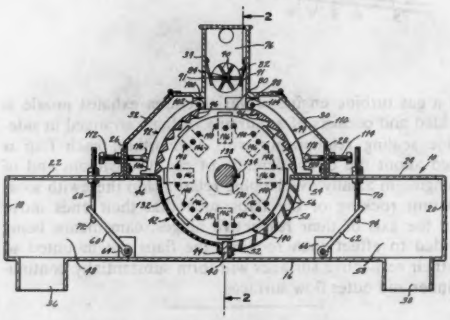
TURBOPULP REFINING BLENDER AND CLASSIFIER

Lloyd D. Smiley, 2915 North Market Street, St. Louis, Mo.

Filed Feb. 10, 1969, Ser. No. 797,959

Int. Cl. B02c *13/09, 13/13, 13/284*

U.S. Cl. 241—46.06 **8 Claims**



The turbopulp-refining blender and classifier is comprised of a refining chamber having an inlet port and a plurality of blades detachably mounted by securing means on a rotor which is rotatably mounted within the refining chamber. The blades have beveled cutting edges on their opposite ends and are each positioned on the rotor with one end disposed outwardly with respect to the rotational axis of the rotor and with the opposite end pointing inwardly with respect to the rotational axis of the rotor. The refining chamber includes adjustable walls adapted to be moved inwardly and outwardly with respect to the rotor.

3,630,459

LINING FOR CYLINDRICAL MILLS

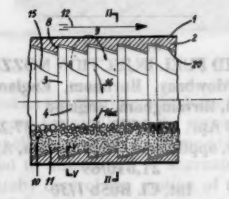
Pierre Marie Arsene Slegten, 158 Avenue du Prince d'Orange, 1180 Brussels, Belgium

Filed Mar. 5, 1970, Ser. No. 16,828

Claims priority, application Belgium, Mar. 5, 1969, 729.390

Int. Cl. B02c *17/22*

U.S. Cl. 241—183 **12 Claims**



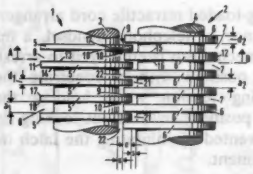
The improvement provides a lining for a cylindrical ball or tube mill partly filled with grinding media, which lining has an inside surface bounding a series of trunco-conical volumes which each have a flare towards the mill inlet, the

generatrices of any two consecutive truncated cones forming different angles with the mill axis and therefore, producing small-flare truncated cones alternating with large-flare truncated cones, the minor base of the small-flare cones coinciding with the major base of the large-flare cones, the minor base of the large-flare cones meeting the major base of the small-flare cones in an annular surface which is substantially perpendicular to the mill axis; at the limit, said small-flare cones may be cylinders.

3,630,460
PAPER SHREDDER

Albert Goldhammer, D773 Bodensee, Postfach 128, Nussdorf, Bodensee, Germany

Filed Oct. 20, 1969, Ser. No. 867,664
Claims priority, application Germany, Nov. 9, 1968, P 18 08 155.5
Int. Cl. B02c *4/08, 4/30*
U.S. Cl. 241—236 **8 Claims**

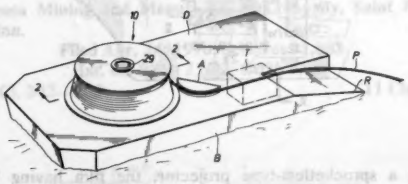


A shredding apparatus for paper and the like is defined by a pair of spaced, parallel counterrotating rolls provided with spaced-apart, cylindrical and overlapping shredding discs. The discs do not come into contact, for friction-free operation of the shredder and have sharp corners and a high friction surface finish for engaging inserted paper. The paper is stretched and thereby torn or shredded as it is engaged by the discs and passes between the rolls.

3,630,461
SUPPLY REEL FOR CONTINUOUS LAYING OF PIPELINES

Daniel E. Sugasti, New Orleans, La.; Larry Rayner Russell, and Fred W. Schaejbe, both of Houston, Tex., assignors to Fluor Ocean Services, Inc., Houston, Tex.

Filed Jan. 26, 1970, Ser. No. 5,840
Int. Cl. B65h *75/00*
U.S. Cl. 242—54 **8 Claims**

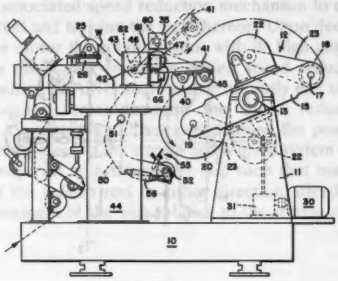


A reel mountable for rotation about a vertical axis on a supporting base for supplying long continuous lengths of relatively large diameter pipe for continuous laying of pipelines, particularly marine pipelines, said reel comprising an upwardly and inwardly tapering frustoconical hub and upper and lower horizontally disposed flanges.

3,630,462
WEB-WINDING APPARATUS

John E. Nordgren, Fulton, N.Y., and Hans Wirth, Milwaukee, Wis., assignors to The Black Clawson Company, Hamilton, Ohio

Filed Oct. 31, 1969, Ser. No. 872,873
Int. Cl. B65h *75/34*
U.S. Cl. 242—64 **9 Claims**

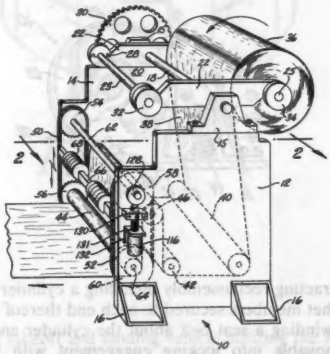


Web-winding apparatus including a reel on which a roll being wound is contacted by a rider roll, and a potentiomer associated with the rider roll monitors the roll buildup and controls a DC-indexing motor to rotate the winding roll away from the rider roll to maintain substantially constant pressure between the rider roll and the winding roll. A control circuit controls the acceleration and deceleration of the indexing motor as the rolls are being changed to permit web tension to be maintained constant.

3,630,463
WEB-TENSION CONTROL APPARATUS

Victor J. Mistele, Colgate, Wis., assignor to Faustel, Inc., Butler, Wis.

Filed Sept. 22, 1969, Ser. No. 859,864
Int. Cl. B65h *25/22*
U.S. Cl. 242—75.43 **13 Claims**

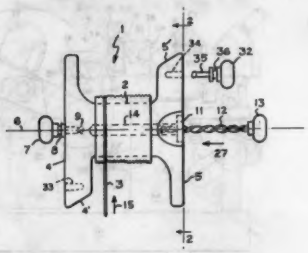


A web-tension control apparatus for maintaining tension in a web being unwound from a roll in an unwind stand. The stand has a brake for retarding rotation of the roll and a sensory means, such as a dancer roll, for sensing the tension of the web being unwound. The apparatus includes control means for generating an operating signal level and a signal means operable by the sensory means for altering the operating signal level to establish a range of tension regulating signals for application to the brake. The operating signal level provided by the control means may also be altered, responsive to the sensory means to change the range of the tension-regulating signals.

3,630,464
REEL DEVICE

William E. Fagan, 337 Trapelo Road, Belmont, Mass.

Filed Oct. 30, 1968, Ser. No. 771,946
Int. Cl. B65h *75/40*
U.S. Cl. 242—96 9 Claims

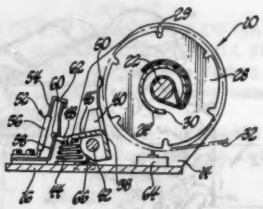


A reel for a line includes two handles located along the axis of the reel, and adapted to be grasped by an operator's left and right hand respectively; at least one of the handles is attached to the reel by a mechanism such that movement of that handle along the axis of the reel drives the reel in rotation about the axis so that the line is wound onto or played off of the reel.

3,630,465
ROTARY RETRACTING DEVICE

John S. Cucheran, Pleasant Ridge, Mich., assignor to Jim Robbins Seat Belt Co., Mt. Clemens, Mich.

Filed July 14, 1969, Ser. No. 841,531
Int. Cl. A62b *35/00*
U.S. Cl. 242—107.4 9 Claims

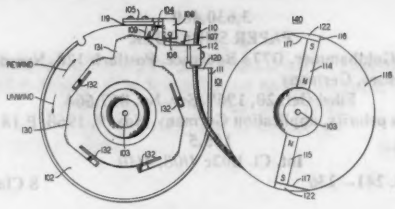


A retracting reel assembly including a cylinder with circular ratchet members secured to each end thereof for winding and unwinding a seat belt about the cylinder and a locking pawl movable into locking engagement with the ratchet members to prevent unwinding of the seat belt. The locking pawl is held out of locking engagement with the ratchet members by mechanical engagement with a catch in a leaf spring and the position of the leaf spring is controlled by a bimetallic strip. An electrical circuit is included to control the bimetallic strip so that the locking pawl is held out of locking engagement with the ratchet members for a predetermined time after the seat belt is moved in the unwinding direction whereby the seat belt may be extended and jockeyed back and forth by further extension and retraction until in the proper position before the locking pawl engages the ratchet members to prevent further unwinding of the seat belt.

3,630,466
LATCH MECHANISM FOR A RETRACTILE CORD REEL

Wilfred J. Kindermann, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 6, 1969, Ser. No. 874,454
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.7 6 Claims

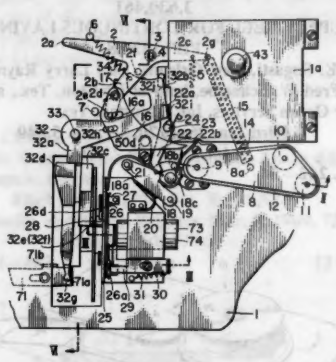


In a spring-loaded retractile cord arrangement for an electrical appliance or telephone handset, a magnetically actuated catch mechanism is employed to arrest the cord at any preselected position without requiring the user to work against spring tension while holding the cord in that preselected position. Inadvertent locking during the rewind cycle is prevented by inhibiting the latch mechanism with a cam arrangement.

3,630,467
AUTOMATIC FILM-REWINDING DEVICE FOR PROJECTOR

Tadao Hayami, and Atsutada Nakatani, both of Tokyo, Japan, assignors to Kabushiki Kaisha Koparu

Filed Mar. 26, 1970, Ser. No. 22,834
Claims priority, application Japan, Mar. 31, 1969, 44/24614
Int. Cl. B65h *59/38;* G03b *1/04;* G11b *15/32*
U.S. Cl. 242—186 4 Claims



In a sprocketless-type projector, the film having been wound around a takeup reel can be automatically rewound on a supply reel upon completion of the projection without changing the direction of rotation of the driving motor and without virtually changing the path followed by the film during the projection, by the provision of an automatic film-rewinding device structure and operative so that the members adapted to be actuated by the tension produced in the film between the claw and the supply reel to which the terminal end of the film is fixed cause both the pressure plate and the

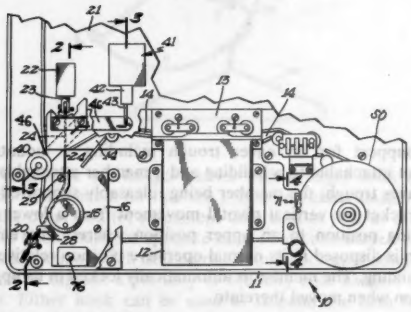
claw to retreat from the film face and at the same time cause the swingable plate having two idlers to effect reverse shifting of its position to switch over the transmission of rotation of the motor from the state of being effected through only one of the two idlers to the state of being effected through both these two idlers to thereby transmit the rotation of the motor to the shutter shaft coupled to the shaft of the supply reel.

3,630,468

FILM HANDLING APPARATUS

William K. Christoffersen, Minneapolis; James L. Keely, Wayzata, and William T. Owens, Jr., Long Lake, all of Minn., assignors to Washington Scientific Industries, Inc., Long Lake, Minn.

Filed July 27, 1970, Ser. No. 58,311
Int. Cl. G03b *1/04*; G11b *15/32*
U.S. Cl. 242—195 **7 Claims**



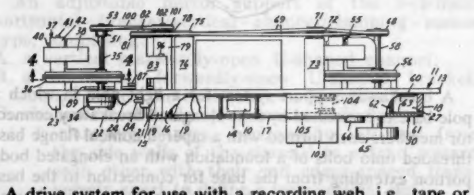
A sensing switch, when opened, provides a signal to stop the film threading operation and when closed provides a signal to unlatch a supply reel. A single-pole, single-throw switch is mounted adjacent a takeup reel and is opened by the forced motion of a movable flange on the takeup reel, such forced motion resulting from a film leader, whose width is larger than the biased dimension between the movable flange and a fixed flange being driven between them by a drive-out roller. Opening the switch causes a solenoid to be deenergized which allows the drive-out roller to move away from the leader. When the leader is removed from the takeup reel because of a rewind operation, the switch is closed, activating a solenoid which removes a latch from a plate upon which the supply reel is mounted, permitting the reel to be removed.

3,630,469

WEB TRANSPORT SYSTEM

Thomas A. Turgeon, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 24, 1970, Ser. No. 31,683
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—203 **11 Claims**



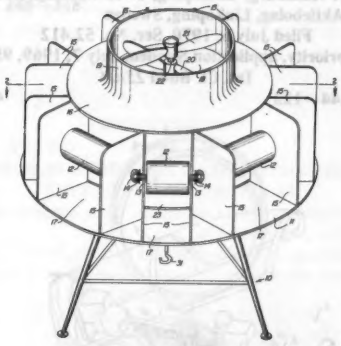
A drive system for use with a recording web, i.e., tape or microfilm, to move the web past a station, viewing or recording, and for registering with the station a desired portion of the web. The drive system comprises a single-phase induction motor having an axially movable rotor and drive shaft which couples and uncouples with a speed reduction mechanism connected to a drive shaft for a supply reel, and a similar motor and speed reduction mechanism connected to the drive shaft for a takeup reel. The motors are controlled by a three-position switch to energize one motor or the other. When either motor is energized the rotor of that motor couples with the associated speed reduction mechanism to drive the attached reel and to wind the web thereon. Upon deenergization of the motor the rotating rotor with its high angular momentum is uncoupled from the driven speed reduction mechanism causing the drive shaft to stop abruptly due to the frictional retarding forces in both the speed reduction mechanisms. A counter is utilized to determine the position of the web with respect to the station and a drive system connects the takeup reel with the supply reel such that manual adjustment of the takeup reel in either direction affords incremental movement of the web relative to the station along the web path.

3,630,470

VERTICAL TAKEOFF AND LANDING VEHICLE

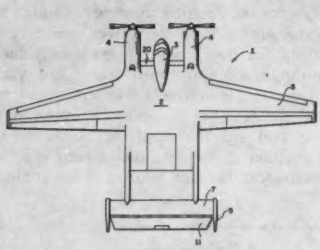
Frederick Thomas Elliott, Paze Inc. APO 96307, San Francisco, Calif.

Filed Feb. 13, 1970, Ser. No. 11,066
Int. Cl. B64c *27/00*
U.S. Cl. 244—21 **10 Claims**



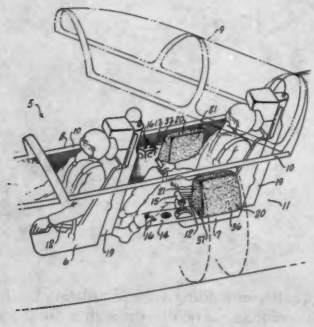
A vertical takeoff and landing vehicle utilizing the Magnus effect to lift the vehicle vertically through a fluid medium, usually air but conceivably other gaseous atmospheres as well as water. A plurality of horizontal, rotatable cylinders are arranged, preferably in opposite pairs, about the surface of a normally horizontal support member near the perimeter thereof. Drive means are provided for rotating the cylinders simultaneously in an upward and outward direction toward the periphery of the support member. A cover member is disposed above the cylinders to define a plenum chamber therewith. The cover member has a center aperture provided with means to draw a stream of fluid into the plenum chamber and force it laterally across the upper and lower surfaces of the rotating cylinders. If desired, drive means can be provided for moving the vehicle in a lateral direction.

3,630,471
NOSE SLAT FUSELAGE LIFTING BODY
Charles G. Fredericks, Silver Spring, Md., assignor to Occidental Aircraft Corporation, Washington, D.C.
Filed Mar. 7, 1969, Ser. No. 805,185
Int. Cl. B64c *1/00*
U.S. Cl. 244—36 8 Claims



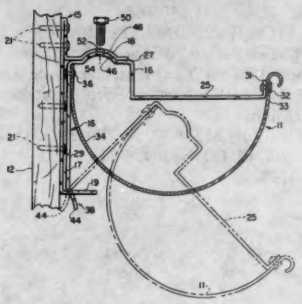
Combined airfoil lifting fuselage and airfoil wing short takeoff and landing aircraft have lift promoting nose slats spaced forward and above a leading edge of the fuselage.

3,630,472
PROTECTION DEVICE FOR OCCUPANT OF AIRCRAFT EJECTION SEAT
Carl Evert Axenborg, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden
Filed July 6, 1970, Ser. No. 52,412
Claims priority, application Sweden, July 7, 1969, 9575/69
Int. Cl. B64d *25/04*
U.S. Cl. 244—122 4 Claims



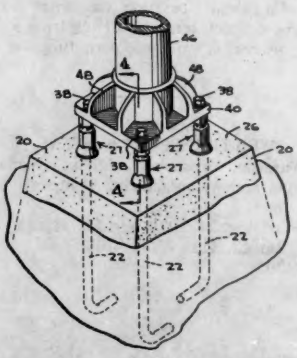
In an aircraft having an ejection seat and having a recess in its cabin defined by an overhanging wall, a collapsed bladder is arranged in the recess to provide an unobtrusive cushion for normal flight. The bladder is rapidly inflated just prior to ejection, whereupon it forcefully displaces the seat occupant's limb to a position safe for ejection and fills the recess to prevent the airman from inserting a body member thereinto. Quick inflation expedients are disclosed, operable in an automatic ejection sequence.

3,630,473
GUTTER SUPPORT
Robert D. Landis, 98 Emerald Drive, W. Seneca, N.Y.
Filed Apr. 3, 1970, Ser. No. 25,433
Int. Cl. E04d *13/06*
U.S. Cl. 248—48.2 5 Claims



A support for an eaves trough including a mounting bracket attachable to a building and a member attachable to the eaves trough; the member being releasably supported by the bracket for vertical pivotal movement from a lower assembling position to an upper position wherein the eaves trough is disposed in its normal operative position relative to the building. The member is automatically locked in its upper position when moved thereinto.

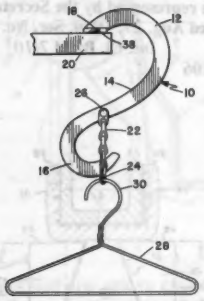
3,630,474
BREAKAWAY POLE SUPPORT STRUCTURE
Ray C. Minor, Abingdon, Va., assignor to Kearney-National Inc., New York, N.Y.
Continuation-in-part of application Ser. No. 12,358, Feb. 18, 1970, now abandoned. This application Aug. 18, 1970, Ser. No. 64,699
Int. Cl. E04b *1/41*
U.S. Cl. 248—158 7 Claims



A breakaway support system for a light pole in which a pole base is connected by four elongated breakaway connector members each formed with a tapered conical flange base threaded onto bolts of a foundation with an elongated body portion extending from the base for connection to the base member of a pole with the body portion being divided by an annular circumferential recess providing a weakening along

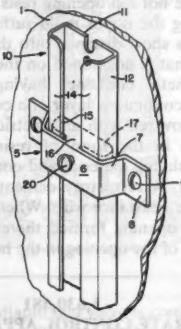
which a break occurs in the event the pole is subjected to a predetermined force.

3,630,475
INVERTIBLE HANGER CARRIER
James H. Barry, 7123 Olivetas, La Jolla, Calif.
Filed Dec. 15, 1969, Ser. No. 885,249
Int. Cl. A47f *5/00*
U.S. Cl. 248—215 1 Claim



A multiple use hanger carrier with a larger hook at one end for placement on a person's shoulder, and a smaller hook at the other end for placement on a clothes pole or the like, these hooks being at opposite sides of a scroll-shaped central shank portion which also carries a multiapertured pendant or chain to support a plurality of ordinary coat hangers or the like. Either hook can be used to suspend the item from a counter edge or shelf.

3,630,476
ADJUSTABLE MIRROR SUPPORT
Vincent J. Lococo, 2006 Gladstone Ave., Louisville, Ky.
Filed Mar. 9, 1970, Ser. No. 17,707
Int. Cl. A47g *1/24*
U.S. Cl. 248—476 3 Claims



An adjustable mirror support of the 3-element horizontal - bracket/vertical - channel/clamping - means type, comprising:

A. a vertical rearwardly-open U-shaped channel;

B. a horizontal forwardly-open U-shaped bracket, through which the channel extends vertically;

C. channel-bracket clamping means including

1. clamping flanges, horizontally inturned from the side walls of the channel to extend toward each other with their end edges spaced transversely apart to define a long vertical slot,

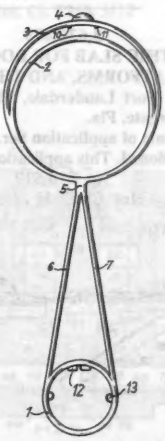
2. a post, having rear and front ends and forwardly diverging sidewalls, mounted at its rear end or the inner bight face of the bracket with its sidewalls diverging forwardly into the slot of the channel and terminating within the channel in a pair of clamping flanges, which are horizontally outturned at an obtuse angle and which provide rearwardly facing clamping surfaces, and

3. screw threaded means on the bracket for moving the channel forwardly from an unclamped position to a clamped position, wherein,

a. in the clamped position, the channel's clamping flanges engage the bracket's clamping flanges while the slot-forming edges of the channel's flanges extend so closely adjacent the front end portions of the forwardly diverging sidewalls of the bracket post as to prevent any significant transverse play therebetween, and thereby center the channel on the bracket, and

b. in the unclamped position, the channel's clamping flanges are spaced rearwardly from the bracket's clamping flanges while the slot-forming edges of the channel's clamping flanges are transversely spaced from the rear end portion of the forwardly diverging sidewalls of the bracket post sufficiently to permit significant transverse play between the channel and the bracket and thereby allow nonbinding movement of the channel relative to the bracket.

3,630,477
BOTTLE SUSPENSION HARNESS
Reinhard Stadler, Wormserstrasse 3, Karlsruhe, Germany
Filed July 7, 1970, Ser. No. 52,815
Claims priority, application Germany, Mar. 17, 1970, P 20 12 501.3
Int. Cl. A61b *19/00*
U.S. Cl. 248—318 11 Claims

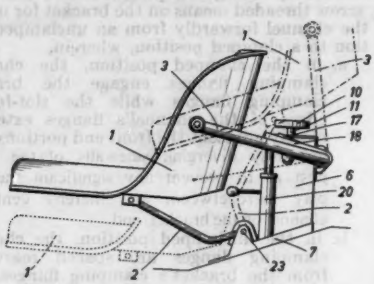


The invention is concerned with a flat-molded flexible harness of plastics material for supporting bottles, particularly transfusion bottles, in an inverted position in which two interconnected portions are provided for supporting the neck and body of the bottle and a hanger is molded integrally with the body-supporting portion.

3,630,478
SEAT STRUCTURE FOR AGRICULTURAL TRACTOR

Otto Klepp, Buchengasse 111-113, Vienna, Austria

Filed May 15, 1970, Ser. No. 37,758
Int. Cl. A47c 7/00
U.S. Cl. 248—376 8 Claims

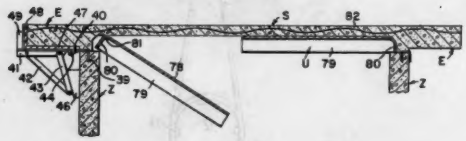


A housing has a rear wall, which is remote from a seat bucket, an upper spring abutment, and two extensions extending laterally away from said spring abutment. Generally vertical compression spring means engage said spring abutment. A linkage having the configuration of a four-bar linkage comprises lower links and an approximately U-shaped element which comprises upper links and a web, which connects said upper links and is rotatably mounted in said rear wall and carries a nose extending through said window and two forwardly directed bearing arms, which bear on said extensions. Said linkage supports said seat bucket on said compression spring means. A locking hook is mounted in said housing and biased by a biasing spring to a locking position, in which said spring housing overlies said nose and prevents an upward pivotal movement of said lower links and seat bucket beyond a predetermined seating position. A lever is manually operable to move said locking hook out of said locking position against the force of said biasing spring.

3,630,479
MONOLITHIC SLAB FOR ROOFS, FLOORS, PLATFORMS, AND THE LIKE

Jack E. Sullivan, Fort Lauderdale, Fla., assignor to Futura Roofs, Inc., Margate, Fla.

Continuation-in-part of application Ser. No. 797,937, Feb. 10, 1969, now abandoned. This application Apr. 23, 1969, Ser. No. 818,517
Int. Cl. E04g 11/00
U.S. Cl. 249—19 5 Claims

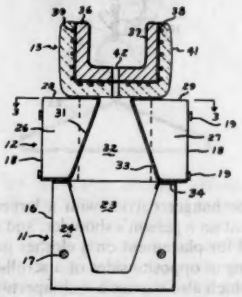


The means and method herein described may be used to produce upon supporting walls an elevated monolithic slab of concrete or the like, to serve as roofs, gabled or flat, for building structures generally, for floors of buildings, for platforms, etc. Use is made of a simplified form structure comprising a plurality of reusable form units, all alike, assembled side by side and end to end, to be erected upon supporting walls therefor and upon a temporary intermediate supporting means, in such a way as to permit pouring of fluid concrete thereover and thereinto to produce, when set, a slab which rests directly upon the tops of such walls. As part of the monolithic slab thus produced, built-in joists or trusses may be formed upon its underside concurrently in the single concrete-pouring operation involved. All form units are so interfitted as to remain fixedly in operative positions, minus any fastening means therefor, thereby facilitating a subsequent dismantling of the form structure, unit by unit, for removal and repeated use elsewhere.

3,630,480
MOLD ASSEMBLY FOR CASTING INGOTS

Shingo Inouye, Kettering, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Aug. 27, 1970, Ser. No. 67,449
Int. Cl. B22d 7/10
U.S. Cl. 249—106 5 Claims



In a mold assembly there is provided an improved hot top comprising a plurality of wedge-shaped fire bricks or refractories which, when positioned and held together, form a refractory body having a frustum-shaped opening therein. An asbestos cloth lines the opening and extends outwardly therefrom, resting on the fire brick surfaces around the upper and lower ends of the opening. The hot top is positioned on an open mold so that the cavity in the mold and the lower and larger end of the hot top opening communicate with one another, and the asbestos cloth extending outwardly from the lower end of the hot top opening rests on an asbestos ribbon or tape covering the upper mold surface adjacent its cavity and extending a short distance into the cavity. A tundish is also provided that is positioned on the hot top. The tundish comprises a metal container having its interior surface covered with a continuous layer of a ceramic material and its outer surface covered with an electrical insulating material. Heating means in the form of resistance wire is wound around the insulating material and connected to a source of electric current. A refractory cement covers the insulating material and the resistance wire. When the tundish is in position, a bottom opening formed therein communicates with the smaller end of the opening in the hot top.

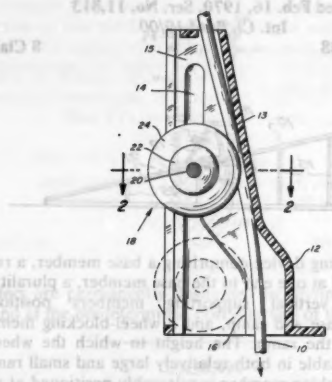
3,630,481
DRIP-RATE CONTROL APPARATUS FOR INTRAVENOUS ADMINISTRATION

John B. McGay, 1551 South Yorktown Place, Tulsa, Okla.

Continuation-in-part of application Ser. No. 852,243, Aug. 21, 1969, now Patent No. 3,570,531, and a continuation-in-part of 48,040, June 22, 1970. This application July 21, 1970, Ser. No. 56,907
Int. Cl. F16k 7/06
U.S. Cl. 251—6 3 Claims

A wedge-type pinch roller is formed of a resilient material and includes a peripheral opening capable of controlling the flow of flexible tubing used in intravenous administration sets. Movement of the roller element, in one position, relative to the flexible tubing pinches the tubing to effectuate in

the remaining portion an orifice of size as a function of desired drip-rate flow therethrough. Movement in another



position either changes said drip rate or closes the peripheral opening because of the resilient nature of the pinch roller and hence shuts off flow in the tubing.

3,630,482

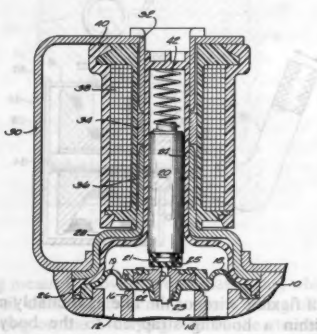
SOLENOID-OPERATED VALVE HAVING A PLASTIC SOLENOID GUIDE TUBE

Wilbert E. Beller, Park Ridge, Ill., assignor to Controls Company of America, Melrose Park, Ill.

Continuation-in-part of application Ser. No. 830,597, June 5, 1969, now abandoned. This application Dec. 17, 1969, Ser. No. 885,907

Int. Cl. F16k *31/06*

U.S. Cl. 251—30 **1 Claim**



The pilot-operated diaphragm valve is controlled by a solenoid-actuated plunger guided in a plastic tube having a very thin wall to minimize the loss of magnetic coupling while providing freedom from corrosion and electrolysis with reduced wear and substantial reduction or elimination of vibration buzz or hum. The plastic guide is supported throughout its thin wall length by upper and lower flux sleeves of magnetic material separated by a nonmagnetic material which in this case is a portion of the plastic coil bobbin but can alternatively be any nonmagnetic material. The extended lip on the plastic tube helps seal the diaphragm and prevents extrusion of the diaphragm under high pressure. The flat valve face seating on the rigid valve seat insert in the diaphragm alleviates centering problems and allows increased clearance between the plunger and tube.

3,630,483

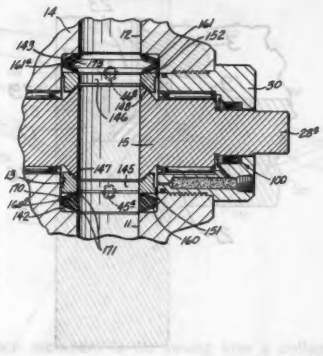
VALVES

Carlos R. Canalizo, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 11, 1970, Ser. No. 18,629

Int. Cl. F16k *5/20*

U.S. Cl. 251—174 **15 Claims**



A rotary plug valve having seat means provided with minimum interface engagement of said seat means with the valve closure means, and low-friction sealed trunnion mounts assuring low-torque actuation under high-pressure conditions and for long service intervals, wherein the seat means and the trunnion mounts are provided with secondary high-temperature seals for preventing escape of fluids from the valve in the event of damage or destruction of the primary seal means as a result of elevated temperature.

3,630,484

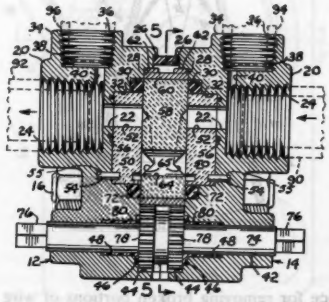
RESTRICTOR VALVE

Julian S. Taylor, 8600 S.W. 8, Oklahoma City, Okla.

Filed Mar. 3, 1970, Ser. No. 16,165

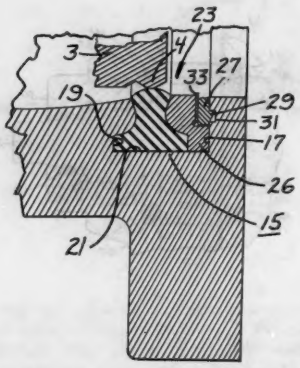
Int. Cl. F16k *5/12*

U.S. Cl. 251—208 **4 Claims**



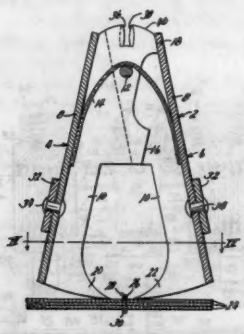
In a restrictor valve, having a flow passage, a pair of aligned orifice plates are positioned in the housing to define an intermediate portion of the flow passage. A central disk, interposed between the pair of plates, is provided with an opening mating and mismating with the flow passage upon axial rotation of the disk. Externally operated gear means, extending through the housing, engages the periphery of the disk for axial rotation of the latter.

3,630,485
BUTTERFLY VALVE SEAT
Hubert L. Williams, Hinsdale, Ill., assignor to Crane Co., Chicago, Ill.
Filed May 25, 1970, Ser. No. 40,241
Int. Cl. F16k 1/226; F15j 15/16
U.S. Cl. 251—307 5 Claims



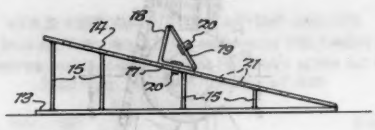
A seat structure for butterfly valves in which shim means are inserted between two body rings to adjustably compress a resilient seat axially to thereby effect the desired radial clearance between the internal diameter of the seat and the disc closure member.

3,630,486
BROKEN STAPLE REMOVER
Joseph A. Foitle, 10601 West 89th Street, Overland Park, Kans.
Filed May 28, 1969, Ser. No. 828,646
Int. Cl. B25c 11/00
U.S. Cl. 254—28 6 Claims



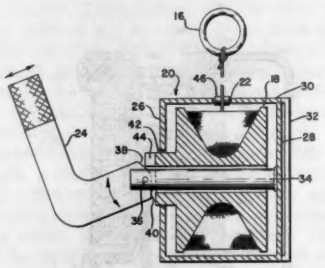
A device for removing broken portions of wire staples of the type used to secure together sheets of paper or the like, said device comprising a pair of overlying planar arms pivoted together on an axis normal thereto, said arms having cooperating notches formed in matching edges thereof generally radially of said pivot, whereby relative pivotal movement of said arms moves said notches from a position of registry, at which they may be engaged over the projecting portion of a broken staple, to an out-of-registry position to grip said wire between the edges thereof, whereupon said arms may be used as a pulling tool to withdraw the broken staple portion from the sheets in which it is engaged.

3,630,487
WHEEL-RAISING DEVICE
Lester E. Wechter, Jr., 404 Collins Avenue, West Seneca, N.Y.
Filed Feb. 16, 1970, Ser. No. 11,813
Int. Cl. B66f 19/00
U.S. Cl. 254—88 8 Claims



A wheel-raising device comprising a base member, a ramp member joined at one end to the base member, a plurality of spaced-apart vertical supporting members positioned between the base and ramp, and a wheel-blocking member positioned on the ramp. The height to which the wheel is raised is adjustable in both relatively large and small ranges. The wheel-blocking member is releasably positioned at various locations along the ramp member, and the orientation of the blocking member at each location can be changed to vary the angle between the ramp and the wheel-contacting surface of the blocking member. The base, ramp, and supporting member can be fixedly attached to each other or, alternatively, pivotally connected whereby the device is collapsible for storage.

3,630,488
SELF-LOWERING MECHANISM
Anton Stangl, 27 Egremont Road, Brighton, Mass.
Filed Oct. 6, 1969, Ser. No. 863,904
Int. Cl. A62b 1/08
U.S. Cl. 254—154 3 Claims

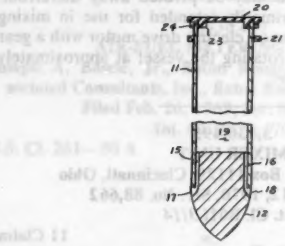


A reel of flexible wire, or the like, is rotatably mounted on a reel within a housing strapped to the body. A hand-operated lever is pivoted to a fixed shaft and is indexed into and out of engagement with a shoulder stop on the reel for controlling the rate of descent of the wearer when the wire end is secured to a fixed object. The device is useful as a portable fire escape mechanism or the like.

3,630,489
SNOW FENCE POST HOLDER
Hubert Cordell, Sr., 946 Fife Avenue, Wilmington, Ohio
Filed May 6, 1970, Ser. No. 34,937
Int. Cl. E04h 12/22
U.S. Cl. 256—12.5 1 Claim

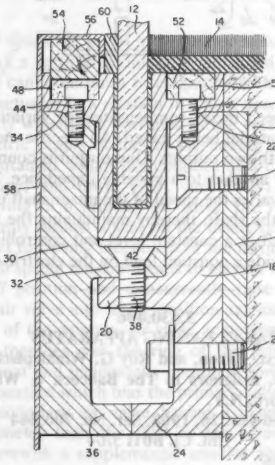
A pointed cast-iron tip, to facilitate driving into the ground, having drain passages, is fitted into the end of a section of pipe. The pipe provides lateral support to the inserted post and the tip provides drain passages for water and verti-

cal support for the post. A cover prevents the entry of foreign material into the holder when it is not holding a post.



Holders are permanently positioned by driving them in the ground at the predetermined post intervals of the snow fence.

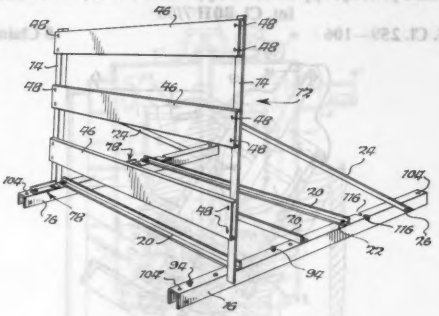
3,630,490
SIDE-MOUNTED SUPPORT
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed June 17, 1970, Ser. No. 47,022
Int. Cl. E04h 17/16
U.S. Cl. 256—24 **4 Claims**



Mounting means is provided for a glass panel which is part of a handrail unit; the mounting means being adapted for flush mounting on the overhung side of the structure which supports the mounting means so that the top edge thereof is flush with the upper surface of the supporting structure.

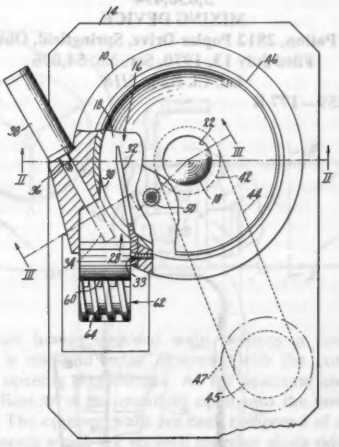
3,630,491
COLLAPSIBLE SAFETY BARRICADES
Guy S. Puccio, Lancaster, N.Y., assignor to Pu-Ro Products, Inc., Bowmansville, N.Y.
Continuation-in-part of application Ser. No. 815,105, Apr. 10, 1969, now abandoned. This application Mar. 26, 1970, Ser. No. 22,760
Int. Cl. E01f 13/00
U.S. Cl. 256—64 **10 Claims**

A pair of upright legs having horizontal panels extending therebetween are pivotally mounted at their lower ends to horizontally extending members. The panels are provided with reflective faces having markings thereon. Diagonally extending brace members are pivotally mounted at their lower ends to the base members by shear bolts and at their upper ends to the legs for quick detachment therefrom enabling the



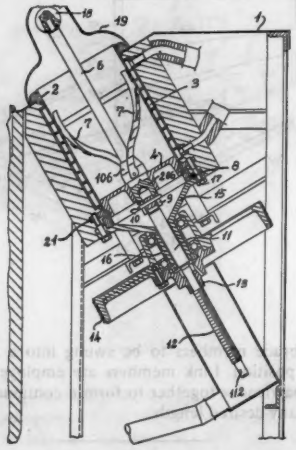
legs and brace members to be swung into a collapsed inoperative position. Link members are employed to connect adjacent barricades together to form a continuous barricade system of any desired length.

3,630,492
MIXING APPARATUS
Manfred Hubner, New Haven, Conn., assignor to USM Corporation, Boston, Mass.
Filed Sept. 4, 1970, Ser. No. 69,530
Int. Cl. B01f 7/26
U.S. Cl. 259—8 **10 Claims**



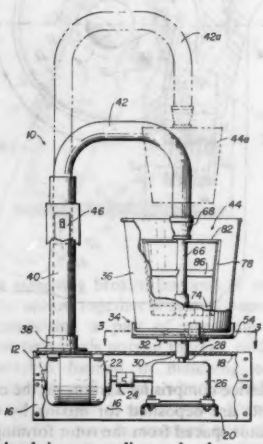
A mixing device comprising a rotor, on the center of which dry ingredients are deposited for mixing by external agitation, and a stator spaced from the rotor forming a chamber in which liquid ingredients are introduced, wetting the dry ingredients moved along a face of the rotor by centrifugal force forming a viscous mass which is mixed by internal shear forces in the chamber.

3,630,493
AUTOMATIC MACHINES FOR THE BATCHWISE PRODUCTION OF ICE CREAM
Poerio Carpigiani, Bologna, Italy, assignor to Apaw S.A., Fribourg, Switzerland
Filed Oct. 13, 1969, Ser. No. 865,602
Claims priority, application Italy, Oct. 22, 1968, 7416 A/68
Int. Cl. B01f 7/00
U.S. Cl. 259—106 5 Claims



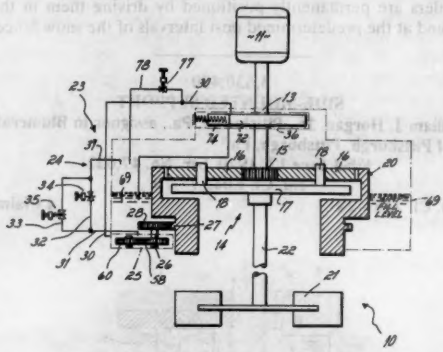
The invention relates to machines for batchwise mixing, especially small ice cream machines comprising a fixed container or freezing can with a slidable bottom plate and a rotatable dasher, and means for lifting said slidable bottom plate, together with the ice cream resting on it, by reversing the dasher-revolving direction and lowering the bottom plate by resuming the driving of the machine in a dasher-revolving direction.

3,630,494
MIXING DEVICE
Robert J. Patton, 2812 Poplar Drive, Springfield, Ohio
Filed July 13, 1970, Ser. No. 54,096
Int. Cl. B28c 5/18
U.S. Cl. 259—177 R 6 Claims



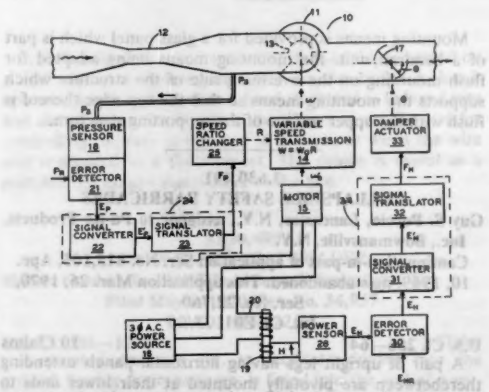
Mortar is mixed in an ordinary bucket mounted on a rotatable support and a nonrotatable mixing blade located in the bucket. The bucket is supported on a base by a power operated support member and gripped thereto by an inertia operated chuck. In operation, the bucket can be removed without manipulation of the chuck even while the support is rotating. A mixing blade is mounted on a vertically movable bracket and can be manually raised or lowered relative to the bucket, and when raised may be pivoted away therefrom. The mixing device is primarily intended for use in mixing mortar, for which purpose an electric drive motor with a gear reducer is provided for rotating the vessel at approximately 40 revolutions per minute.

3,630,495
MIXER UNIT
Walter N. Carroll, P. O. Box 11129, Cincinnati, Ohio
Filed Nov. 12, 1970, Ser. No. 88,662
Int. Cl. B01f 3/14
U.S. Cl. 259—182 11 Claims



A variable speed mixer compensates for variations in the viscosity of a material being mixed. An electric motor drives a differential with two outputs. One output is connected to a mixer shaft and another to a variable impedance. The variable impedance varies the speed of the mixer shaft in response to the load on the shaft, thereby maintaining the torque applied to the shaft at a constant level and controlling the differential to provide a constant load on the electric motor.

3,630,496
GAS-CLEANING APPARATUS
Thomas B. Hurst, Akron, and Roy G. Winklepleck, Hudson, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.
Filed Jan. 26, 1968, Ser. No. 700,844
Int. Cl. B01f 3/04
U.S. Cl. 261—26 10 Claims



A gas-cleaning apparatus in which the speed and power level of an induced draft fan are jointly regulated to maintain

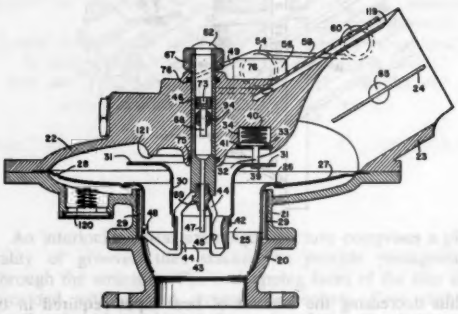
a constant gas volume flow rate through a venturi scrubber connected in series with the fan, and to thereby maintain a substantially constant pressure drop across the venturi scrubber for improved gas cleaning action therein.

3,630,497

AIR-FUEL METERING SYSTEM

Joseph A. Bascle, Jr., Baton Rouge, La., assignor to Associated Consultants, Inc., Baton Rouge, La.

Filed Feb. 26, 1969, Ser. No. 802,558
Int. Cl. F02m 7/04
U.S. Cl. 261—50 A 8 Claims



The fuel discharge jet of a carburetor is supported by the lower end of a vertically adjustable fuel supply tube in which is affixed a cam contoured to cooperate with a member of a fuel valve actuator in a relation in which descent of the tube progressively widens the port area of the valve and increases the volumetric supply of fuel to the mixing chamber, which latter is contained within the confines of a cylindrical skirt, open at upper and lower ends, which skirt is part with a horizontal ring of a primary air valve, the ring adapted to close upwardly against a seat on the inside of the cover section incident to closing movement of the throttle valve which acts through spring tension means to elevate the fuel tube to fuel shutoff position and concurrently raise the ring of a secondary air valve into lifting position against the underside of the ring of the primary air valve achieving the closing of both rings together and the ring of the primary air valve against its seat and incidentally compress springs in the carburetor lid section which bias the primary valve to open position, the secondary air valve having a cylindrical skirt of greater diameter than the skirt of the primary valve and forming therewith a supplemental annular air channel open at its lower portion to the manifold and at its upper portion to throttle-controlled incoming air when the two rings are separated, there being spider arms affixed to the lower end of the fuel tube connected to the skirt of the secondary valve for lifting the secondary valve and subsequently entraining with the secondary valve the primary valve to close both valves when the throttle valve shall have been closed.

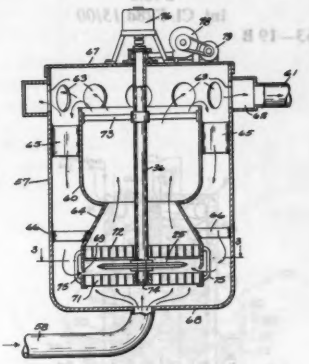
3,630,498

APPARATUS FOR GASIFYING AND DEGASIFYING A LIQUID

George D. Bielinski, Green Bay, Wis., assignor to Namco Corporation, Green Bay, Wis.

Filed July 31, 1968, Ser. No. 749,188
Int. Cl. B01f 3/04
U.S. Cl. 261—87 7 Claims

This disclosure relates to apparatus for gasifying and degasifying liquid. The gasifying apparatus introduces tiny gas bubbles into the liquid in vast quantities to surcharge the liquid with adsorbed gas greatly in excess of the capacity of the liquid to absorb said gas. The bubbles are introduced in a cavitation technique in which the bubbles are shattered into myriad tiny bubbles so small that they will remain in suspension in the liquid for long periods of time where they will be readily available for absorption into the liquid as its chemical and biological demand requires. The degasifying apparatus uses a reverse cavitation principle to withdraw gas from the liquid in the form of larger bubbles which will rise to the surface to discharge the gas from the liquid.

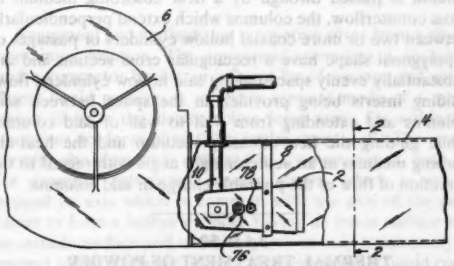


3,630,499

BURNER

Frederick A. Kramer, Jr., 2040 Conway Road, St. Louis County, Mo.

Filed Oct. 31, 1969, Ser. No. 873,025
Int. Cl. F23l 9/04
U.S. Cl. 263—19 A 15 Claims

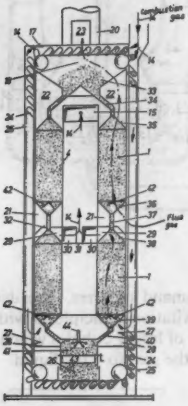


A burner having opposed walls defining a combustion chamber is disposed in an airstream with the combustion chamber opening downstream. At the upstream end of the walls, orifices of a gas manifold open into the combustion chamber. The opposed walls are each composed of a plurality of segments which are secured together along side flanges so that the intervening bight portions of the segments form a continuous wall surface. Slots extend across the segments, terminating at the side flanges thereof, and the slots on some of the opposed wall segments are staggered with respect to one another and with respect to the orifices so that air introduced through them forms vortices within the combustion chamber about the orifices. Outer walls form air supply chambers with the back faces in the combustion chamber walls and the air supply chambers are fed with combustion air from the airstream through an inlet opening upstream.

3,630,500
REGENERATIVE HEAT EXCHANGER

Willibald Kraus, Grebenstein, Germany, assignor to Rheinstahl Henschel Aktiengesellschaft, Kassel, Germany

Filed Feb. 9, 1970, Ser. No. 9,492
Claims priority, application Germany, Feb. 8, 1969, P 19 06 348.0
Int. Cl. F28d 15/00
U.S. Cl. 263—19 B 10 Claims



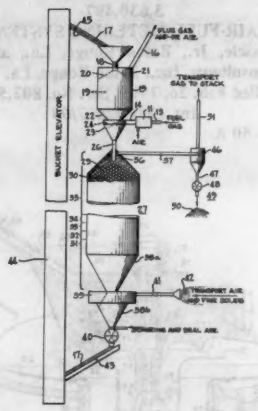
A regenerative heat exchanger operable with a circulating pourable charge, which comprises pourable charge receiving columns having gas-permeable walls and being arranged one above the other while the upper column is passed through by a heat-releasing medium in cross counterflow and the lower column is passed through by a heat absorbing medium in cross counterflow, the columns which extend perpendicularly between two or more coaxial hollow cylinders or passages of a polygonal shape have a rectangular cross section and are substantially evenly spaced along said hollow cylinders, flow-guiding inserts being provided in the space between said columns and extending from wall to wall of said columns while guiding the heat-releasing medium and the heat-absorbing medium at an acute or right angle with regard to the direction of flow of the pourable charge in said columns.

3,630,501
THERMAL TREATMENT OF POWDER

Hubert A. Shabaker, Media, Pa., assignor to Air Products and Chemicals, Inc., Philadelphia, Pa.

Filed Aug. 21, 1970, Ser. No. 65,770
Int. Cl. F27b 15/00
U.S. Cl. 263—19 B 7 Claims

Large uniformly sized inert ceramic balls are heated by combustion gases in a heating zone and then form a gravitating bed of hot ceramic balls in a reaction zone. The heat is transferred to particles of powder suspended in a gas moving upwardly countercurrently through the gravitating bed. The balls serve as a heat sink for narrowing the range of temperature for any endothermic reaction or exothermic reaction. Thus, the temperature of each particle of the suspended power is carefully scheduled. The temperature range is kept advantageously narrow in each zone in which a thermal reaction occurs. When raw kaolin is the suspended powder, meta kaolin is formed endothermally near the bottom of the gravitating bed. Deexothermed kaolin is formed higher in the bed at about 1,000° C. and the upflowing deexothermed kaolin powder further increases the temperature of the balls,

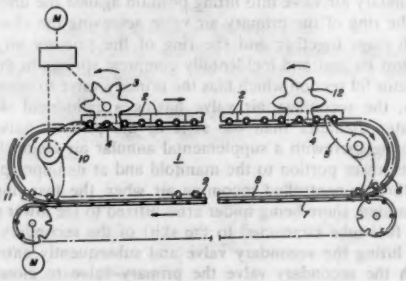


thus decreasing the amount of heat input required in the heating zone for continuous calcination of the kaolin.

3,630,502
APPARATUS FOR THE THERMAL TREATMENT OF SOLIDS

Werner Schmidt, Frankfurt, Germany, assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Apr. 9, 1970, Ser. No. 26,989
Claims priority, application Germany, Apr. 18, 1969, P 19 19 668.0
Int. Cl. F27b 9/00
U.S. Cl. 263—28 6 Claims



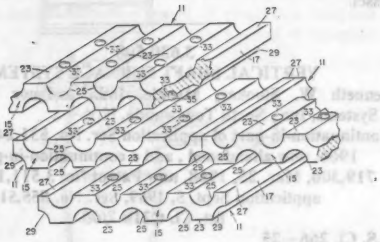
Apparatus for the thermal treatment of solids in straight-traveling grates including a working path extending through a sintering machine where grate trucks are passed therethrough at one speed, and a conveying device for carrying the grate units back to the working path at a speed much greater than the work speed. An acceleration device is positioned at the end of the work path and is shaped to transfer a grate truck to the conveying device while at the same time accelerating the truck to the speed of the conveying device. A deceleration device positioned at the end of the conveying device transfers a grate truck to the work path while decelerating it to the work path speed.

3,630,503

INTERLOCKING TILE STRUCTURE

Carlisle O. Byrd, Jr., Houston, Tex., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Oct. 15, 1969, Ser. No. 866,557
Int. Cl. F23l *15/02*
U.S. Cl. 263—51 5 Claims



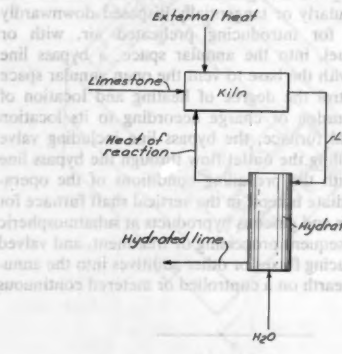
An interlocking heat exchange structure comprises a plurality of grooved tiles stacked to provide passageways through the structure. The overlapping faces of the tiles are provided with aligned recesses or sockets. Keys slightly smaller than, but substantially conforming to the dimension and shape of, said sockets are positioned therein for tying the structure together.

3,630,504

METHOD OF CALCINATION AND HYDRATION AND UNIT THEREFOR

Jack B. Reynolds, Ludington, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 5, 1970, Ser. No. 732
Int. Cl. C04b *1/02*
U.S. Cl. 263—53 R 3 Claims



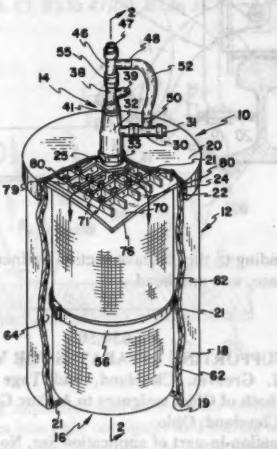
An improved method of calcining and hydrating limestone wherein the heat of hydration of lime is recycled to calcine further limestone to lime. By so doing, the amount of external heat necessary for calcination is significantly reduced. A combined kiln-hydrator unit containing a calcination chamber, a hydration chamber with heat diffuser and product conduit therebetween, which can be employed in the present method, is also disclosed.

3,630,505

SILVER RECOVERY

Byron R. MacKay, 2952 Robidoux Road, Sandy, Utah

Filed Mar. 9, 1970, Ser. No. 17,836
Int. Cl. C22b *3/02*
U.S. Cl. 266—22 3 Claims



Equipment and methods for recovering silver from a silver-containing solution. The equipment comprises a container and a connector having an influent liquid passage and an effluent liquid passage. A recovery element made of a metal above silver in the electromotive force series fits within the container to form a metallic replacement cell. The metal forming the element is arranged in a woven matrix, such as, for example, galvanized window screen, which is wound around its axis which is common with the axis of the container to form a hollow cylinder having an inside surface and an outside surface and which is pervious only transversely in respect to the container. One of the passages is in liquid communication with the inside surface of the element, and the other passage is in liquid communication with the outside surface of the element. The solution precipitates silver in exchange for the metal of the woven matrix, without clogging of the cell.

3,630,506

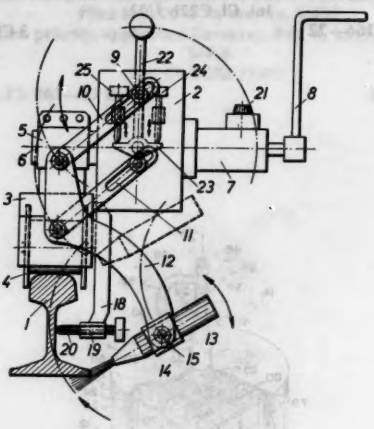
RAIL-CUTTING MACHINE

Franz Plasser, and Josef Theurer, both of Johannesgasse 3, 1010 Vienna, Austria

Filed Nov. 13, 1969, Ser. No. 877,194
Claims priority, application Austria, Nov. 26, 1968, A 11,506/68
Int. Cl. B23k *7/04*
U.S. Cl. 266—23 HH 7 Claims

In a rail-cutting machine, a blowtorch is so guided for pivotal movement in relation to the rail in a plane transverse

thereof that the blowtorch remains at a constant distance from the rail while moving through a convex cutting path



corresponding to the concave section defined in this plane by the rail base, web and head.

3,630,507

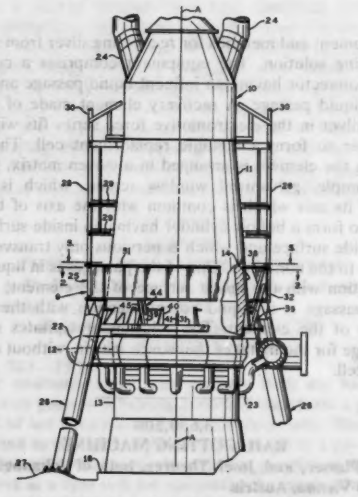
SUPPORTING APPARATUS FOR VESSELS

Melvin J. Greaves, Cleveland, and Tage Werner, Rocky River, both of Ohio, assignors to Arthur G. McKee & Company, Cleveland, Ohio

Continuation-in-part of application Ser. No. 778,883, Aug. 29, 1968, which is a division of application Ser. No. 520,945, , now Patent No. 3,431,691. This application Mar. 28, 1969, Ser. No. 811,527

Int. Cl. C21b *7/00*

U.S. Cl. 266—25 **45 Claims**



Apparatus for supporting a vessel, such as a blast furnace having a shell, comprising a main frame that surrounds the shell and is connected to and at least partially supports the shell by members that are under longitudinal stresses that can fluctuate but do not undergo stress reversal during normal operations of the vessel. A compression ring or auxiliary frame member surrounds the vessel and is fixed to the frame to stabilize it. Stabilizing tie means, all preferably essentially in the same horizontal plane, are disposed around the periphery of the shell and are connected to the shell and the frames. The supporting apparatus for the vessel also includes diverging legs rigidly connected to the main frame; during construction the lower ends of these legs are supported off center from the centers of the legs to enable the lower ends of the legs to deflect outwardly by amounts corresponding to the amounts that they would deflect when loaded with the vessel.

3,630,508

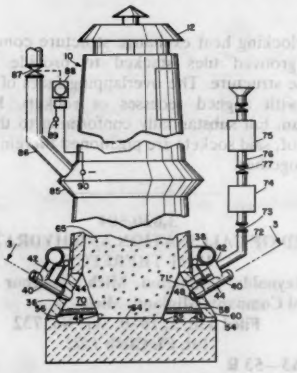
VERTICAL SHAFT FURNACE SYSTEM

Kenneth W. Stookey, Markle, Ind., assignor to Torrax Systems, Inc., North Tonawanda, N.Y.

Continuation-in-part of application Ser. No. 531,244, Mar. 2, 1966, now abandoned , and a continuation-in-part of 719,300, Mar. 25, 1968, now Patent No. 3,511,194. This application Sept. 5, 1969, Ser. No. 855,516

Int. Cl. C21b *7/00*

U.S. Cl. 266—25 **10 Claims**



A vertical shaft furnace in which the burden or charge is supported at the base of the furnace with an open annular space surrounding the charged material within the hearth, one or more angularly or tangentially disposed downwardly inclined tuyeres for introducing preheated air, with or without added fuel, into the annular space, a bypass line which connects with the base to vent the open annular space and thereby control the degree of heating and location of heating of the burden or charge according to its location within the vertical furnace, the bypass line including valve means for controlling the outlet flow through the bypass line in accordance with the prevailing conditions of the operations, an intermediate takeoff in the vertical shaft furnace for removing volatiles and gaseous byproducts at subatmospheric pressures for subsequent processing or treatment, and valved means for introducing fluxes or other additives into the annular space at the hearth on a controlled or metered continuous basis.

3,630,509

TREATMENT OF MOLTEN MATERIAL

David Robson Glyn Davies, Greenlands, Henley-on-Thames, and Leslie Joseph Shaw, Glossop, both of England, assignors to Spray Steelmaking Ltd., London, England

Filed Apr. 18, 1969, Ser. No. 817,315

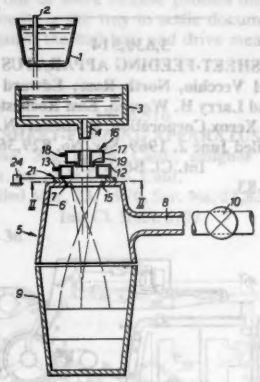
Claims priority, application Great Britain, Apr. 19, 1968, 18,505/68

Int. Cl. C21c *7/00*

U.S. Cl. 266—34 R **9 Claims**

The invention is directed to means for removing accretions from the gas discharge nozzle or nozzles of apparatus for

treating molten materials in which a freely falling stream of the molten material is shattered by a flow of gas directed at the stream. The accretion-removing means may comprise scrapers movable either continuously or intermittently across



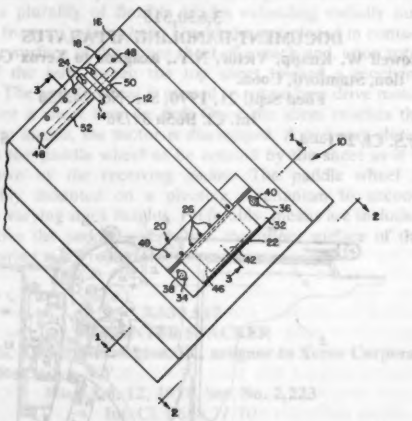
the face of the orifices of the or each gas discharge nozzles. Alternatively, the accretions may be removed or may be prevented from forming by a high-frequency vibrator connected to the gas discharge device.

3,630,510

APPARATUS FOR MAKING MICROFICHE

Augustus W. Griswold, Rochester, and Boris W. Haritonoff, Geneseo, both of N.Y., assignors to Atlantic Microfilm Corporation, Spring Valley, N.Y.

Filed Apr. 27, 1970, Ser. No. 32,307
Int. Cl. B23q *3/18*; B25b *5/00*; B25f *1/02*
U.S. Cl. 269—14 **19 Claims**



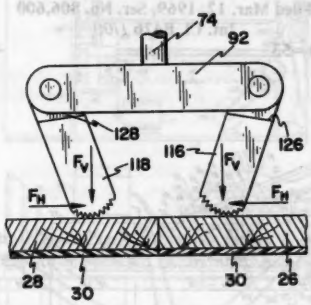
Apparatus for accurately positioning in alignment and in registration, a plurality of microfilm strips each provided with a leading-end perforation and a trailing-end perforation, comprising a set of leading-end pins and a set of trailing-end pins. The pins of one set are sufficiently smaller in diameter than the pins of the other set, such that any distortion occurring in any of the strips mounted thereon will occur only adjacent one end thereof, i.e. at the end adjacent the smaller diameter pins. The pins define a microfilm strip plane, to which the leading-end pins are perpendicular while the trailing-end pins slant toward the leading-end pins, whereby each strip can be made taut by pushing the trailing-end thereof down on the slanted pin. One set only of the pins is adjustable, for varying the spacing separating the two sets of pins. Astripper is mounted adjacent one set of pins for simultaneously and easily removing all microfilm strips mounted on the pins.

3,630,511

JOINT-FORMING APPARATUS

Ralph M. Evans, Glendale, and Alton L. Fritz, Phoenix, both of Ariz., assignors to Royal Industries, Inc., Pasadena, Calif.

Filed July 28, 1969, Ser. No. 845,334
Int. Cl. B23b *41/00*; B23q *3/00*
U.S. Cl. 269—43 **17 Claims**



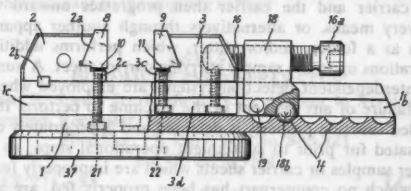
A joint-forming apparatus and method for bringing side-by-side workpieces into tight contiguity and joining the workpieces to present an even face-joint, the apparatus including a force-applying clamp mechanism which is longitudinally positionable at any one of a variety of positions along an elevated support beam and having spaced, power-displaceable gripping eccentrics which are pivotally carried by a bracket and actuated by a power cylinder to grip opposed workpieces and to draw the workpieces together in face-to-face alignment and into edge-to-edge tight contiguity in response to reciprocation of the eccentrics essentially normal to the gripped workpiece surfaces accompanied by pivoting of the eccentrics. Drill guide structure is provided which is adapted to be fixedly positioned over the contiguous joint of the workpieces to guide a drilling tool in fabricating screw-receiving angular blind bores across the joint at precise locations.

3,630,512

CLAMPING DEVICE, PARTICULARLY FOR A MACHINE TOOL

Paul Paret, 24 Rue Marbeuf, Grenoble, France

Filed Sept. 18, 1969, Ser. No. 858,931
Claims priority, application France, Sept. 25, 1968, 167468
Int. Cl. B25b *1/12*
U.S. Cl. 269—138 **2 Claims**



The invention concerns a clamping device, particularly for a machine tool, and is characterized by the relatively fixed

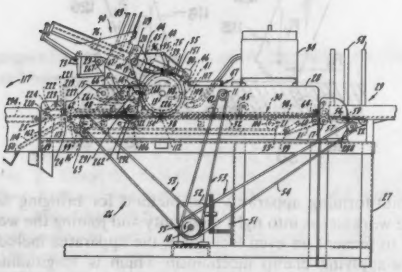
and relatively movable jaws of the device having projecting shoulders which are situated below floating faceplates and which support those faceplates. Each shoulder provides a foundation for a resilient element inserted between each faceplate and its associated shoulder and receives at least one fixing element for respectively attaching the relatively fixed jaw to the vise base and the relatively movable jaw to a member movable towards and away from the relatively fixed jaw.

3,630,513

AUTOMATIC TIPPING MACHINE

William W. Davidson, Jr., 26 Bogart Avenue, Port Washington, L.I., N.Y.; Alfred Anderson, Elmhurst, and Eugene A. Anderson, Lombard, both of Ill., assignors to said William W. Davidson, Jr., by said Alfred Anderson and Eugene A. Anderson

Filed Mar. 12, 1969, Ser. No. 806,600
Int. Cl. B42b *1/00*
U.S. Cl. 270—53 **48 Claims**



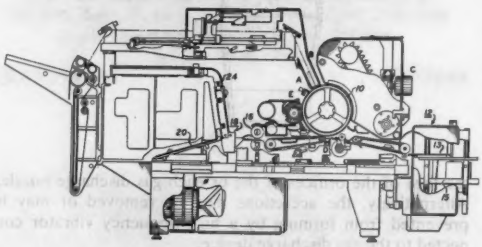
A sample, or printed form, applicator machine for affixing printed forms, or samples of a wide variety of products, to brochures, signatures, envelopes or other carrier sheets, wherein a carrier sheet feeder feeds individual carrier sheets in timed relationship onto a conveyor, which positions them and carries them through the machine. Above the carrier sheet conveyor is a sample (or printed form) feeding mechanism which feeds individual samples (or printed forms) to a sample conveyor in timed relationship to the feeding of carrier sheets, and including means whereby each sample (or printed form) is positioned in a predetermined manner with respect to the carrier sheet to which it is to be affixed; and then as the sample (or printed form) is carried toward the carrier sheet by a sample transfer mechanism, a glue-applying mechanism is actuated to apply a predetermined amount of glue to the underside of the sample (or printed form) at a predetermined position on the sample or to the top of the carrier sheet at a predetermined position on the carrier sheet. The sample transfer mechanism affixed the sample to the carrier sheet at a predetermined position on the carrier and the carrier then progresses onward to a delivery means, or alternatively through another apparatus such as a folder, and/or slitter, which performs additional operations upon the sample carrying carrier sheet. A number of interdependent detection systems are employed whereby the failure of any element of the machine to perform its intended function properly is detected and appropriately compensated for prior to subsequent operational steps; so that either samples or carrier sheets which are improperly fed, or for which no counterpart has been properly fed, are automatically removed from the machine in reusable form, without the application of glue, without stopping the operation of the machine, and in such a manner as to greatly reduce the likelihood of the apparatus jamming up or malfunctioning The operation of the apparatus is cyclic and is capable of automatically delivering carrier sheets with samples (or printed forms) affixed thereto, and thereafter folded one or more times if desired, at a rate of many thousands per hour.

3,630,514

SHEET-FEEDING APPARATUS

George D. Del Vecchio, North Rose; Edward A. Schwartz, Fairport, and Larry H. Warren, East Rochester, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 2, 1969, Ser. No. 829,365
Int. Cl. B65h *45/18*
U.S. Cl. 270—83 **5 Claims**



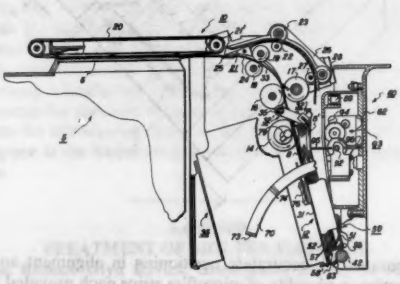
Apparatus for selectively directing sheet material from a first sheet feed path along a second or third sheet feed path. The apparatus includes a selectively shiftable interference member to direct the sheet material along either the second or third path. The interference member may also be selectively moved in relation to the movement of the leading edge of a sheet fed along the third path so that it may be folded and then directed along the second path.

3,630,515

DOCUMENT-HANDLING APPARATUS

Lowell W. Knapp, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 21, 1970, Ser. No. 74,036
Int. Cl. B65h *31/38*
U.S. Cl. 271—4 **5 Claims**



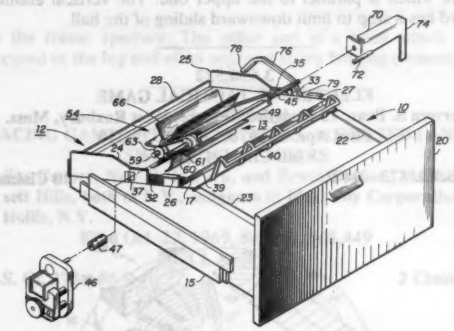
A recirculating document-handling system in which documents are fed in seriatim from a supply to an operating station and returned to the supply for either recycling or removal. The system incorporates a tray to hold the document supply, a feeder for feeding one document at a time

from the bottom of the supply to the operating station and back to the tray, a bail bar to maintain documents returning to the tray segregated from other documents awaiting feeding, at least until the supply of such other documents is used up; and a cover for the tray. The cover includes a rotatable wheel having one or more flexible paddles disposed to wipe against documents in the tray to settle documents returning to the tray against the bail bar, and drive means to turn the paddle wheel.

3,630,516
SHEET-FEEDING APPARATUS

Byung S. Hong, San Diego, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.

Filed Mar. 23, 1970, Ser. No. 21,827
Int. Cl. B65h *3/02*
U.S. Cl. 271—36 **6 Claims**



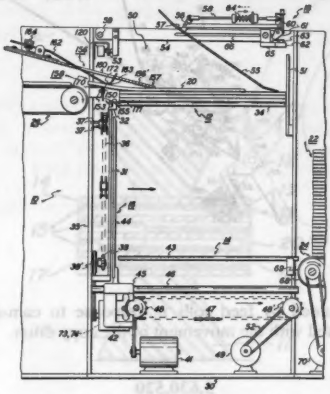
An apparatus for feeding individual sheets of paper or the like from the top of a stack upon demand is disclosed. The device includes a "paddle wheel" feeding device which comprises a plurality of flexible blades extending radially outwardly from an axle or hub. The blades are placed in contact with the surface of the upper sheet of a stack and, upon rotation of the hub, sweep the top sheet toward a receiving means. The paddle wheel is caused to rotate by a drive motor whenever a sheet is to be fed. Once the sheet reaches the receiving means, the motor is disengaged. A one-way clutch permits the paddle wheel to be rotated by the sheet as it is withdrawn by the receiving means. The paddle wheel is preferably mounted on a pivoting mechanism to accommodate varying stack heights. Preferably, means are included to remove the paddle wheel from the upper surface of the stack during stack replenishment.

3,630,517
COUNTER STACKER

Albert G. Enskat, Barrington, Ill., assignor to Xerox Corporation, Rochester, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,223
Int. Cl. B65h *31/10*
U.S. Cl. 271—88 **3 Claims**

An article stacker including a movable elevator upon which articles may be stacked, stack transfer means adapted following predetermined descent of the elevator to intercept and remove a completed stack from the elevator to enable the completed stack to be ejected from the stacker and the elevator reset for the next stack, stack ejector means adapted when actuated to move the completed stack along the stack transfer means and out of the stacker, and control means for the elevator and the ejector means adapted to lower the elevator as a stack builds up thereon, and, following transfer of the completed stack from the elevator to the transfer means, to actuate the ejector means to remove the completed stack, the control means including means to

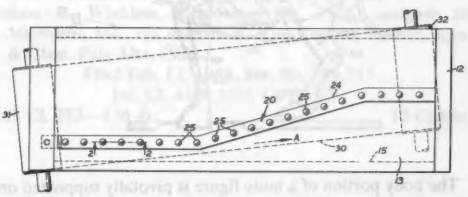


quickly return the elevator to the stack-start position following ejection of the completed stack from the stacker.

3,630,518
SHEET-FEEDING DEVICES

Leslie John Street, Bristol, England, assignor to Parnall & Sons Limited, Birmingham, England

Filed June 16, 1969, Ser. No. 833,316
Int. Cl. B65h *9/16*
U.S. Cl. 271—49 **14 Claims**



A sheet-feeding device comprising a feed path between a pair of superimposed plates and an intervening aligned surface wherein the sheets are transported along the feed path and towards aligning surface by at least one row of balls wherein the latter are rotated by a common driving belt, the axis of movement of the latter being preferably angularly adjustable relevant to the aligning surface.

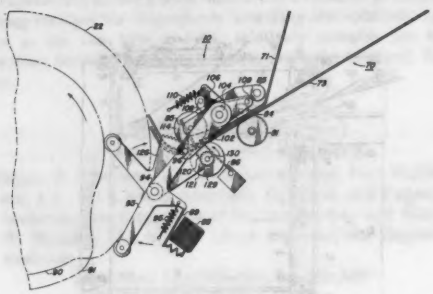
3,630,519
DOCUMENT FEED APPARATUS

Merton R. Spear, Jr., Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,821
Int. Cl. B65h *9/04*
U.S. Cl. 271—53 **1 Claim**

Document feed apparatus for feeding documents onto a moving copy drum in proper registration and at a proper interval to enable the document to be secured on the copy drum. The documents are fed into a chute which advances

them to a gate where they are held until ready to be received by the copy drum. At this time the gate is lifted and document advanced by feed rolls in response to cam-actuated devices timed with the movement of the copy drum.



3,630,520

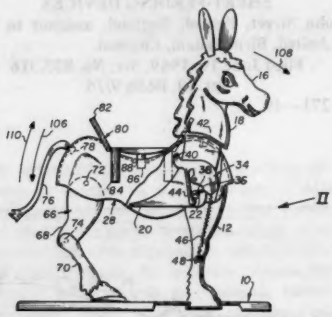
GAME WITH BUCKING ANIMAL

Julius Cooper, New Hyde Park, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed June 1, 1970, Ser. No. 41,969

Int. Cl. A63f 9/00

U.S. Cl. 273—1 R **11 Claims**



The body portion of a mule figure is pivotally supported on a base member and held in a generally horizontal position by a spring-biased detent. The addition of weights to the body overcomes the force of the detent causing the unsupported body to drop. The head portion, of the mule is also pivoted to the base and is held in a latched position against the bias of a second spring. When the body drops, it releases the latch which causes the head portion to accelerate due to its spring. A kicker member on the head portion engages the body portion causing it to accelerate along with the head portion thus simulating a bucking motion which throws off the weights.

3,630,521

BASEBALL BATTING PRACTICE DEVICE

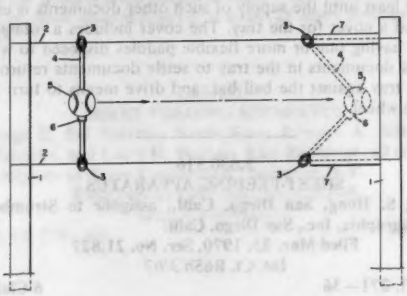
John Lingbeek, and Helen Dorothy Lingbeek, both of Mammoth Spring, Ark.

Filed Dec. 9, 1968, Ser. No. 783,457

Int. Cl. A63j 5/00

U.S. Cl. 273—26 **2 Claims**

A baseball batting practice device including a ball mounted in a position to be struck by a batter. The ball is slidably disposed on a short vertical elastic cord. Each end of this cord is provided with a ring. The top ring is slidably disposed on an upper horizontal wire stretched between two vertical posts. The bottom ring is slidably disposed on a lower wire which is parallel to the upper one. The vertical elastic cord has a stop to limit downward sliding of the ball.



3,630,522

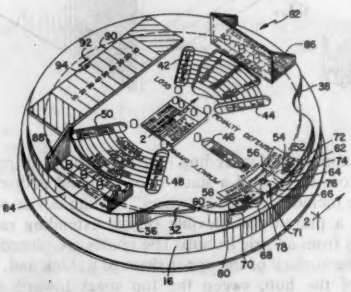
ELECTRONIC TACTICAL GAME

Merwyn S. Bear, 15 Hodgdon Terrace, West Roxbury, Mass.

Filed Apr. 3, 1970, Ser. No. 25,310

Int. Cl. A63f 7/06

U.S. Cl. 273—94 R **10 Claims**



A board formed with a plurality of openings and having indicia of a game illustrated on the upper surface thereof is affixed to a platform which is rotatably mounted to a base. A rotatable computing wheel having a plurality of alphanumeric characters in arcuate rows and radial columns printed on the upper surface thereof is interposed between the board and platform, selected columns of alphanumeric characters being visible through the openings. Indicators in juxtaposition with selected openings oscillate in response to signals as at the output of a random function generator which is controlled by offensive and defensive switch matrices. Completion of a game maneuver, each game maneuver being specified by offensive and defensive switch positions, is evidenced when the indicators cease to oscillate, the outcome of a maneuver being determined by interpolation of selected indicators and visible alphanumeric characters.

3,630,523

RACKET AND STRING HOLDING ELEMENTS

Jean Rene Lacoste, 1 Avenue du Marechal Maunoury, Paris, France

Filed Apr. 23, 1969, Ser. No. 818,551

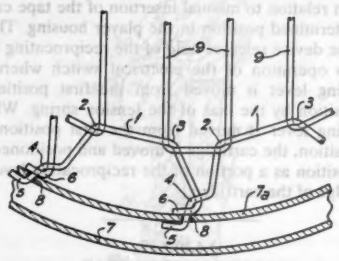
Claims priority, application France, May 8, 1968, 151008

Int. Cl. A63b 51/00

U.S. Cl. 273—73 D **4 Claims**

A tennis racket having string apertures in the frame and string holding elements positionable in the apertures. The

string holding elements are composed of bent wire and have two distinct ends. One end is formed into a lug and is placed



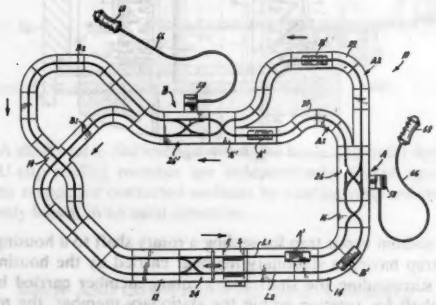
in the frame aperture. The other end is a hook which is secured to the lug end of an adjacent string holding element.

3,630,524

RACING GAME WITH SELECTIVELY ACTUATED LANE SWITCHING MEMBERS

Julius Cooper, New Hyde Park, and Erwin Benkoe, Manhassett Hills, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,449
Int. Cl. A63f *9/14*
U.S. Cl. 273—86 R **2 Claims**



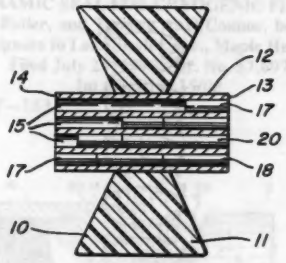
A racing game to be played with at least two vehicles which are driven at substantially the same speed wherein a track is arranged to establish a raceway including at least a first course and a second course, with the second course being longer than the first course such that the elapsed time to travel the second course with the vehicles traveling at substantially the same speed is longer than the elapsed time to travel the first course. The raceway includes at least two crossover means on the track which are arranged to be manually controlled by the players of the game such that the vehicles travelling along the first and second courses at substantially the same speed may be switched to and from the longer and shorter of the courses under the control of the players whereby, notwithstanding the constant speed limitation of the respective vehicles, it is possible to cause one of the vehicles to traverse the raceway, or one or more turns about the raceway, in the shorter elapsed time than the other player-controlled vehicle.

3,630,525

BOARD GAME APPARATUS

Joseph A. Weisbecker, 1220 Wayne Avenue, Cherry Hill, N.J.

Filed May 26, 1970, Ser. No. 40,632
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 D **4 Claims**



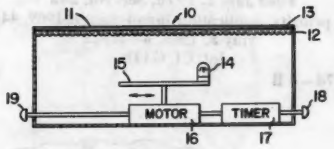
A game construction including a screen for shielding the activities of players from each other, a body disposed centrally of said screen and having opposite ends presented to respective players and provided with a plurality of through passageways each opening through respective opposite body ends, and a plurality of elongate playing pieces of different lengths and insertable into selected body passageways, said pieces being shorter than the passageways and of uniform diameter throughout their length, whereby they may be pushed completely through a passageway.

3,630,526

VARIABLE FORMAT GAME BOARD

Nelson B. Winkless, III, Sunnyvale, Calif., assignor to Microlens, Inc., c/o Andrew B. Kjos Teeters, Palmer, Kjos & Glass, Palo Alto, Calif.

Filed Feb. 12, 1968, Ser. No. 704,711
Int. Cl. A63f *3/00*; G09b *3/00*
U.S. Cl. 273—136 A **13 Claims**

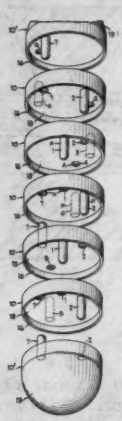


A game board comprising a lens mosaic and an adjacent image bearing transparency incorporating a plurality of game board formats for selective display of a desired game board format format on a screen by a light source spaced from the game board. There is also provided a mechanism for producing relative motion between the game board and light source to selectively change the game board format and vary the game board conditions of a particular game according to a random or programmed temporal sequence.

3,630,527
PUZZLE COMPRISING DISCS WITH INTERENGAGING PINS AND APERTURES

Jeffrey D. Breslow, Chicago, Ill., assignor to Glass, Marvin & Associates

Filed Feb. 9, 1970, Ser. No. 9,651
Int. Cl. A63f 9/12
U.S. Cl. 273—157 R 6 Claims

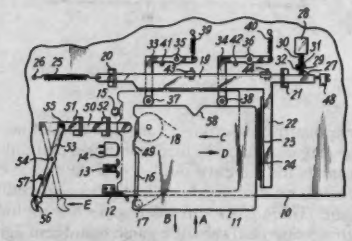


A puzzle-type game comprising a plurality of generally flat, uniform-shaped sections nestable end to end to form an elongated object. The sections all have interengaging surfaces, with the interengaging surfaces of each section being complementary with the surfaces of at least one, or more, but not all of the remaining sections whereby the sections must be properly matched so as to interengage and thereby nest all of the sections to form the elongated object. In the preferred embodiment of the invention, the sections are disc-shaped and the interengaging surfaces comprise at least one pin and one aperture on each section, each pin and aperture having a positional relationship on each section with complementary aperture and pin, respectively, on one, or more but not all of the remaining sections.

3,630,528
TAPE-CARTRIDGE-POSITIONING APPARATUS

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan

Filed Jan. 2, 1970, Ser. No. 242
Claims priority, application Japan, Jan. 1, 1969, 44/2442; May 8, 1969, 44/41578
Int. Cl. G11b
U.S. Cl. 274—4 B 8 Claims



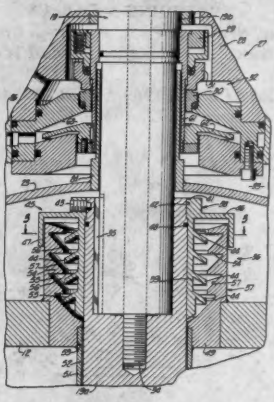
A tape-cartridge-positioning apparatus for an endless magnetic tape cartridge player, comprising a reciprocating lever member slidably supported on a deck within a player housing and biased in one direction by a tension spring, an electromagnetic device for holding the reciprocating lever in a first position against the bias of the tension spring, and a control circuit for the electromagnetic device.

The control circuit includes at least one electrical switch operable in relation to manual insertion of the tape cartridge in a predetermined position in the player housing. The electromagnetic device releases hold of the reciprocating lever in relation to operation of the electrical switch whereby the reciprocating lever is moved from the first position to a second position by the bias of the tension spring. When the reciprocating lever is moved from the first position to the second position, the cartridge is moved and positioned in the playing position as a portion of the reciprocating lever urges the rear edge of the cartridge.

3,630,529
SODIUM VAPOR TRAP

Rowland E. Ball, Long Beach, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 5, 1969, Ser. No. 821,598
Int. Cl. F02f 11/00; F16j 15/00
U.S. Cl. 277—22 8 Claims



A sodium vapor trap for sealing a rotary shaft to a housing, the trap having a stationary member carried by the housing and surrounding the shaft and a rotary member carried by the shaft for rotation within the stationary member, the rotary member and the stationary member having transverse baffles cooperating to provide a tortuous passageway communicating the interior of the housing with the exterior and forming a reflux condenser for condensing the sodium vapor to liquid sodium and returning it to the housing.

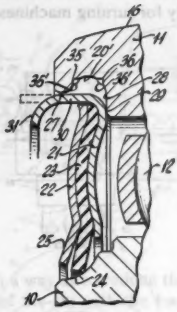
3,630,530
BEARING WITH LOCKED SEAL

Valdimir Mackas, Wethersfield, and Walter S. Pomeroy, Avon, both of Conn., assignors to Textron Inc., Providence, R.I.

Filed Mar. 19, 1969, Ser. No. 808,554
Int. Cl. F16j 15/54
U.S. Cl. 277—94 5 Claims

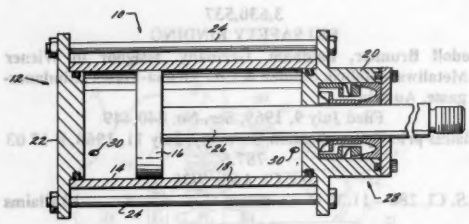
The invention contemplates the antirotational locked assembly of a bearing seal ring to one of the rotational elements of a rotary bearing. The rotary bearing element may be a race ring having a circumferentially extending radially open groove for accommodation of a deformable seal member, upon assembly thereto. One or more locking pro-

jections displaced out of the body of the bearing element enter the nominal inner volume of the groove, so that upon



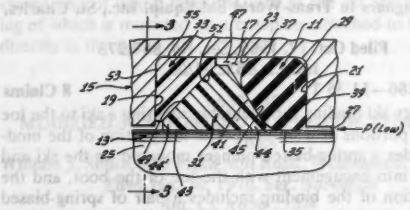
assembly, the deformable seal material develops the desired locked relation of parts.

3,630,531
SHAFT SEAL
Pasquale C. Bondi, Revere, Mass., assignor to General Electric Company
Filed Apr. 27, 1970, Ser. No. 32,076
Int. Cl. F16j *15/00, 15/48*
U.S. Cl. 277—117 **5 Claims**



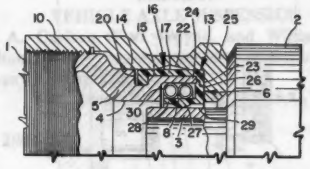
A shaft seal is disclosed in which the inner and outer lips of a U-cup sealing member are independently loaded against their respective contacted surfaces by loading rings independently biased in an axial direction.

3,630,532
HIGH- AND LOW-PRESSURE SEAL ASSEMBLY
Henry A. Traub, Pacific Palisades, and Leslie A. Woodson, Long Beach, both of Calif., assignors to W. S. Shamban & Co., Los Angeles, Calif.
Filed July 16, 1969, Ser. No. 842,178
Int. Cl. F16j *9/06*
U.S. Cl. 277—144 **3 Claims**



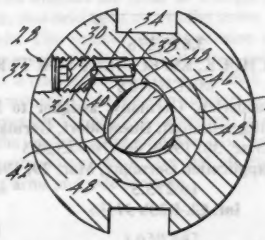
A seal assembly of the type for forming a seal between relatively movable inner and outer members. The seal assembly includes, in one embodiment, nonelastomeric sealing ring means and an elastomeric sealing ring for urging the nonelastomeric sealing ring means into fluidtight sealing engagement with the two members. The elastomeric sealing ring engages both of the members under low-pressure conditions to thereby provide a low-pressure seal and is movable away from one of the members in response to an increase in pressure.

3,630,533
DYNAMIC SEAL FOR CRYOGENIC FLUIDS
Joseph W. Butler, and Terence A. O'Connor, both of Elyria, Ohio, assignors to Lear-Siegler, Inc., Maple Heights, Ohio
Filed July 23, 1970, Ser. No. 57,697
Int. Cl. F16j *15/02*
U.S. Cl. 277—153 **8 Claims**



A fluid seal between two members comprising a flexible sealing ring containing an open channel having radial inner and outer walls, and a seal groove for receipt of the sealing ring, the radial outer wall of the sealing ring being compressed between the outer member and an additional external member surrounding same, and the radial inner wall of the sealing ring being maintained in sealed engagement with the inner member by one or more springs disposed within the seal channel between the outer member and radial inner wall. The forward end of the outer member is also pressed into the end wall of the sealing ring channel to provide a supplemental or backup compression seal for the outer member.

3,630,534
POLYGON TWIST LOCK TOOLHOLDER
Bernard R. Better, Chicago, Ill., assignor to The Bendix Corporation
Filed Jan. 12, 1970, Ser. No. 2,220
Int. Cl. B23b *31/10*
U.S. Cl. 279—1 T **11 Claims**

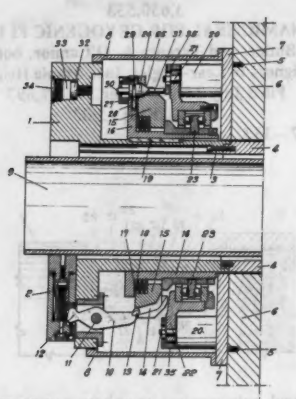


A toolholder of the type having a polygonal bore designed to cooperate with a similarly shaped tool shank to cause these members to wedge together by the torque generated during machining operations to produce a centering action as well as a frictional gripping force between the holder and the tool, featuring a torque preloading arrangement increasing and redistributing the wedging forces created during machining operations.

3,630,535
MACHINE TOOL CHUCK

Pierre E. Renoux, Colombes, France, assignor to Cri-Dan, Paris, France

Filed Apr. 30, 1969, Ser. No. 820,394
Claims priority, application France, July 3, 1968, 157 609
Int. Cl. B23b 31/16
U.S. Cl. 279—15J 11 Claims



A machine tool chuck comprising a chuck body having a plurality of clamping jaws slidably mounted thereon and connected to a compensating actuator mechanism which includes an annular member connected to the clamping jaws by intermediate lever means whereby axial displacement of the annular member causes radial displacement of the clamping jaws between open and closed positions. The annular member is radially floatably mounted on a collar which is concentric with and nonrotatably secured to the chuck body, the collar being slidable axially relative to the chuck body and being connected to a suitable power source. A combined centering and locking device coacts between the collar and the floatable annular member for permitting the floatable annular member to be automatically coaxially aligned with the collar and suitably locked in said coaxially aligned position for permitting use of the chuck with concentric clamping action. The centering mechanism, in a preferred embodiment, comprises a centering pin slidably mounted on the collar and having a conical portion adapted to be disposed into a conical recess formed in the annular member for automatically centering the annular member.

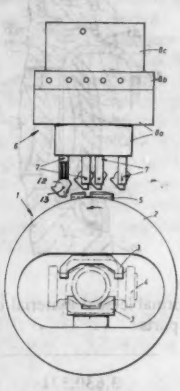
3,630,536
ROTATABLE CHUCK, ESPECIALLY FOR TURNING MACHINES

Hans Scharfen, Buederich, Germany, assignor to Paul Forkardt Kommanditgesellschaft, Duesseldorf, Germany

Filed Mar. 30, 1970, Ser. No. 23,593
Claims priority, application Germany, Mar. 29, 1969, P 19 16 275.5
Int. Cl. B23b 31/36
U.S. Cl. 279—5 11 Claims

The specification discloses a chuck rotatable on a work axis and having workpiece-engaging jaws rotatable on an axis extending perpendicular to the work axis. A disc is connected to rotate with the jaws and protrudes from the side of the chuck body and has elements in the form of grooves or cams thereon facing away from the chuck body. These elements occupy respective axial planes of the chuck body in respective rotated positions of the disc and are adapted for cooperation with feeler members of a control device. A feeler member is located in each said axial plane and is movable from a retracted position away from the chuck body to an advanced position wherein one end is in the path of movement of a respective element of said disc in the respective rotated position of the disc.

The present invention concerns a rotating chuck which is intended particularly for turning machines and is designed as



displaceable or rotatable chuck with clamping jaws which are adapted to be controlled during the rotation of the chuck so as to be displaced transverse to the axis of the chuck body and/or to be pivoted about an axis different from the axis of rotation of the chuck.

3,630,537
SKI SAFETY BINDING

Rudolf Brunner, Baldham, Germany, assignor to Wiener Metallwarenfabrik Smolka & Co., Vienna-Mauer, Lindauergasse, Austria

Filed July 9, 1969, Ser. No. 840,449
Claims priority, application Germany, July 11, 1968, P 17 03 787.5
Int. Cl. A63c 9/08
U.S. Cl. 280—11.35 D 13 Claims

A ski safety binding having a hydraulically operated element to transmit a clamping pressure to secure a ski boot to the ski.

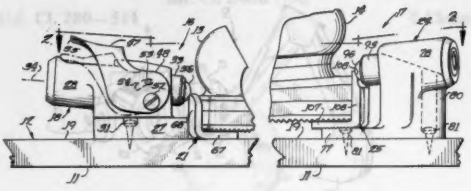
3,630,538
SAFETY SKI BINDING

Bernhard W. Klein, and Gunter L. Steves, both of St. Charles, Ill., assignors to Trans-World Ski-Equip, Inc., St. Charles, Ill.

Filed Oct. 17, 1969, Ser. No. 867,273
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 8 Claims

A safety ski binding for releasably securing a ski to the toe and heel portions of a ski boot. The toe portion of the binding includes a spring-biased plunger mounted on the ski and movable into engagement with the toe of the boot, and the heel portion of the binding includes a pair of spring-biased plungers mounted on the ski and movable into engagement with the heel of the boot. The toe and heel engaging plungers are each inclined downwardly toward the upper surface of the ski, and the heel engaging plungers are also inclined in-

wardly toward the longitudinal center line of the ski. Ball bearings are rotatably and shiftably mounted in the ends of



the plungers in such a way as to reduce the force required to effect engagement of the ski with the boot but to require a greater force to effect disengagement.

3,630,539

HEEL SAFETY BINDING FOR A SKI

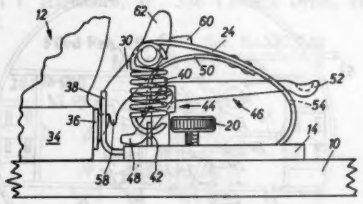
Robert Lusser, deceased, late of Munich, Germany (by Heinz G. Wagner, administrator), and Gustav Schmidt, Munich, Germany, assignors to Lusser GmbH & Co., Ski-Sicherheitsbindungen KG, Munich, Germany

Filed July 8, 1970, Ser. No. 53,220

Claims priority, application Germany, July 23, 9169, P 19 37 501.0

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 T **10 Claims**



A heel safety binding for a ski in which a pressure member extending transversely downwardly toward the front of the ski presses upon the rear edge of the heel of the ski boot or a metal heel fitting under a resilient prestress or tension and, upon attaining admissible maximum load, executes an upward angular movement against the prestress in the vertical longitudinal plane of the ski and during which movement the heel is released from the pressure member after a predetermined point in the upward path of movement. More particularly, the pressure member is connected at its upper portion with the upper leg of a substantially C-shaped leaf spring, the closed end of which faces the rear of the ski and the lower leg of which is mounted on a baseplate attached to the ski or directly to the ski.

3,630,540

MODIFIED SKATE BOARD TO PROVIDE STOPPING ACTION

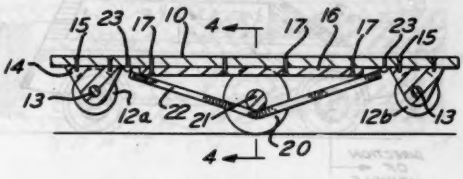
William J. Smith, 515 Plush Mill Road, Wallingford, Pa.

Filed Jan. 20, 1970, Ser. No. 4,320

Int. Cl. A63b *23/04*

U.S. Cl. 280—87.04 A **1 Claim**

An exerciser is disclosed which includes a top board for engagement by the foot, the board having therebelow a centrally disposed longitudinally movable roller to provide a foot and end rollers to provide control: the board can be moved



forward, stopped, steered and maneuvered by the flexing of the ankles of the user.

3,630,541

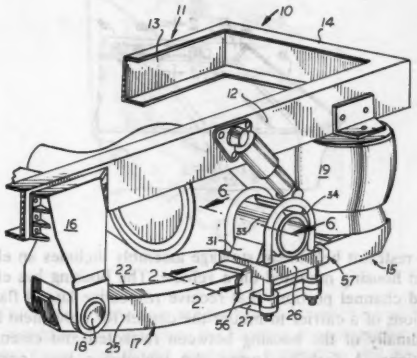
VEHICLE AXLE SUSPENSION

Charles A. Carlson, Fort Wayne, and William S. Locke, Hamilton, both of Ind., assignors to International Harvester Company, Chicago, Ill.

Filed June 11, 1970, Ser. No. 45,467

Int. Cl. B60g *11/26*

U.S. Cl. 280—124 **14 Claims**



A vehicle axle suspension system including an air spring and a pair of trailing arms, beams, or the like for suspending the chassis frame of a motor truck or trailer from the rear axle or axles whether the latter be a single driving or a single trailer axle, two driving or two trailer axles, or a driving and a trailing axle. The vehicle axle suspension system further includes improved means for connecting each end of an axle housing to a respective trailing arm which means includes a resiliently mounted axle housing support or saddle and which means allows limited relative movement in certain directions between the trailing arms and the axle housing but at the same time prevents relative fore and aft movement between the trailing arms and axle housing.

3,630,542

AUTOMATIC CRASH PAD FOR MOTOR VEHICLES

Casimir E. Wycech, 5941 Argyle, Dearborn, Mich.

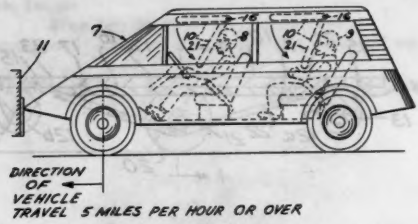
Filed June 1, 1970, Ser. No. 41,841

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 B **6 Claims**

This application discloses a safety crash shield which is supported in the head liner of a motor vehicle, and arranged to automatically move into protective position in front of the driver and passengers upon impact of the vehicle with another object, at and above a predetermined speed. The in-

vention resides in the particular mounting for the device and in the spring-biased lever for triggering the movement of the



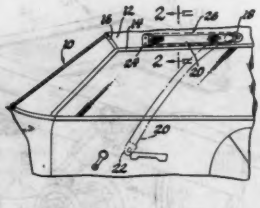
pad, and in the shock-absorbing means for backing up the shield when in operative position.

3,630,543

RESTRAINT BELT LINEAR STOWAGE ASSEMBLY

David J. Cripps, Farmington, and Joseph F. Koral, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 20, 1970, Ser. No. 56,525
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **3 Claims**



A restraint belt linear stowage assembly includes an elongated housing mounted on a vehicle. The housing has elongated channel portions that receive respective lateral flange portions of a carrier to mount the carrier for movement longitudinally of the housing between retracted and extended positions. A forklike spring clip includes a base portion riveted to the carrier. A cable of a spring reel, mounted on the housing, is hooked to the base portion to bias the carrier toward retracted position. A central latch portion of the clip is normally engageable with the housing in extended position to hold the carrier in extended position against the bias of the spring reel. The clip also includes attachment portions, one on each side of the latch portion, that allow selective attaching and detaching of a restraint belt D-ring and the carrier in extended position. With the D-ring attached to the carrier, longitudinal movement of the D-ring toward the spring reel causes the D-ring to move with respect to the carrier and to engage the latch portion. This engagement moves the latch portion out of engagement with the housing and allows the spring reel to move the carrier to retracted position and thus stow a portion of the belt along the longitudinal length of the housing.

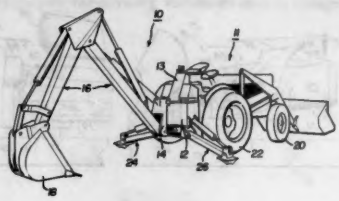
3,630,544

STABILIZER FOR EARTHMOVING MACHINERY

James L. Grisham, West Burlington, and Rudolf Horsch, Burlington, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed June 10, 1970, Ser. No. 44,915
Int. Cl. B60s *9/02*
U.S. Cl. 280—150.5 **2 Claims**

An earthmoving machine, such as a backhoe or the like, carried on a vehicle which is provided with opposite, outwardly extending stabilizer arms which are pivotally mounted on the machine by universal pivot arrangement to permit



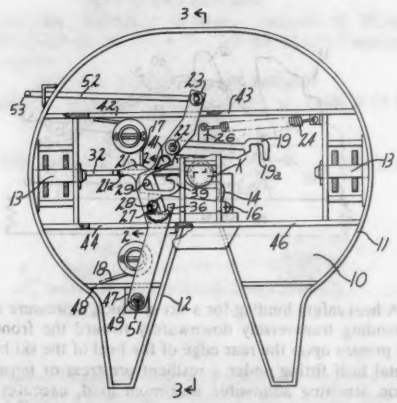
swinging movement of the stabilizer arms in a vertical plane as well as adjustable angular movement of the stabilizer arms in a horizontal plane.

3,630,545

FIFTH WHEEL WITH IMPROVED WEDGE AND JAW OPERATING LEVER

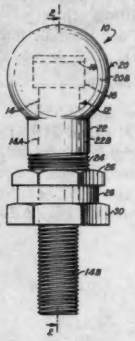
John P. K. Fontaine, Box 704-Route 11, and William D. Benson, both of Birmingham, Ala., assignor to said Fontaine by said Benson

Filed May 18, 1970, Ser. No. 37,992
Int. Cl. B62d *53/08*
U.S. Cl. 280—434 **6 Claims**



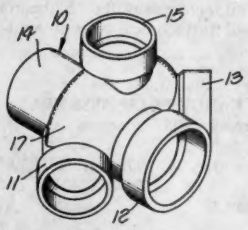
A fifth wheel of the kind having a jaw and a wedge for the jaw, a handle for operating said parts so constructed and arranged that the handle may be assembled for operative connection with the wedge and jaw by passing the handle through the frame parts of the fifth wheel, generally on a level plane, thus eliminating the necessity of cutting vertically enlarged slots through the frame parts, thus retaining the strength of said frame parts. A further improvement is an operating handle which has a pair of side opening slots to receive the pins or the like which operatively connect the handle to the wedge and jaw to permit the assembly aforesaid, and a plate or the like welded to the bottom surface of the handle and spanning the slots, thus to form bottoms for the same, this plate preventing the pins or the like from becoming disconnected with the respective wedge and jaw in the event the pins become loose and also strengthening the handle.

3,630,546
LAND VEHICLE COUPLING MEANS
Leslie L. Church, 1058 W. Juliah Avenue, Flint, Mich.
Filed June 26, 1970, Ser. No. 50,068
Int. Cl. B60d 1/06
U.S. Cl. 280—511 8 Claims



A compound male coupling member for a ball-and-socket-type hitch, and wherein the member is composed of selectively exchangeable components coacting to form hitch balls each having a different diameter.

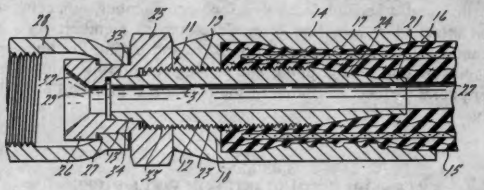
3,630,547
COMBINATION WASTE AND VENT FITTING FOR ABOVE FLOOR MOUNTING
William I. Hartshorn, Jr., 356 Cienaga Drive, Fullerton, Calif.
Filed Feb. 19, 1970, Ser. No. 12,740
Int. Cl. F16l 41/00
U.S. Cl. 285—150 1 Claim



A combination waste and vent fitting of plastic material for use in a baseboard above the floor plumbing system, which can be vertically or horizontally mounted and in a single fitting connects a plurality of waste connections with a single drain connection, and which will, when connected, have a common vent connection.

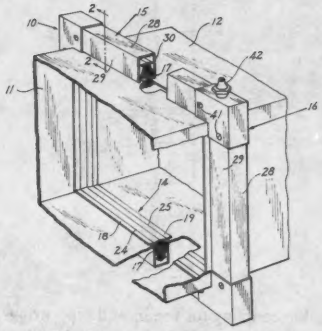
3,630,548
HOSE-FITTING SYSTEM
Robert B. Kimm, and Richard J. May, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.
Filed Jan. 21, 1970, Ser. No. 4,548
Int. Cl. F16l 33/22
U.S. Cl. 285—174 1 Claim

A two-piece hose nipple for mounting in a socket to form a complete hose fitting for securement to a hose end. The nipple comprises a male section threaded into the socket and a female section which can accommodate any of a number of different fitting shapes. The nipple parts are united by a



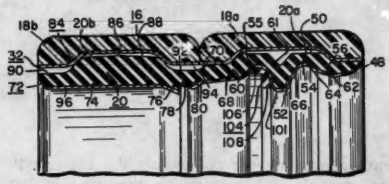
tapered joint so that the two-piece nipple may be unscrewed from a hose and fitting assembly without the two parts becoming disengaged from each other.

3,630,549
FRAME AND CLEAT JOINT CONNECTOR FOR DUCTS
John A. Grimm, Bellvue, Colo.
Filed Jan. 22, 1970, Ser. No. 5,041
Int. Cl. F16p 13/12
U.S. Cl. 285—297 1 Claim



Duct joint connectors are provided, for sheet metal ducts, air conduits and the like, by forming a rectangular inner frame from stock frame material, positioning the ducts in place against the frame, and securing the ducts to the frame by means of external cleats. For rectangular ducts, the corners are enclosed by end caps. Sealing gaskets or mastic may be utilized to seal air gaps between the ducts and the frame.

3,630,550
PIPE COUPLING
Anthony R. Zine, Jr., Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Feb. 20, 1970, Ser. No. 13,006
Int. Cl. F16l 21/00
U.S. Cl. 285—235 11 Claims



A coupling for joining a cylindrical and a beaded pipe end portion, the coupling having a resilient liner surrounding the

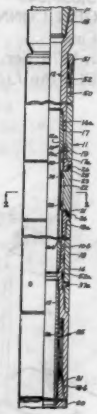
pipe end portions with a first force development member surrounding a first section of the liner and urging the liner first section into sealing relationship with the beaded pipe end portion and a second force development member, adjacent and attached to said first force development member, surrounding a second section of the liner and urging the liner second section into gripping and sealing relationship with a peripheral surface band area of the cylindrical pipe end portion.

3,630,551

EXTENSIBLE COUPLING FOR WELL PIPES

Cicero C. Brown, 5429 Sturbridge Drive, Houston, Tex.

Filed June 29, 1970, Ser. No. 50,794
Int. Cl. F16l *25/00*
U.S. Cl. 285—330 3 Claims



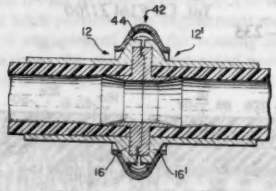
An extensible coupling for use in well pipe strings, particularly rotary drill strings, to permit relative longitudinal, nonrotative movement between sections of the pipe string by employing a spline connection in which the male spline member is removably mounted in the wall of the outer coupling member.

3,630,552

HOSE COUPLING

Edward J. Byron, Waltham, Mass., assignor to Sweetheart Plastics Inc., Wilmington, Mass.

Filed Apr. 6, 1970, Ser. No. 25,934
Int. Cl. F16l *33/22*
U.S. Cl. 285—331 4 Claims



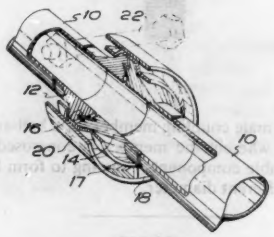
A sanitary coupling for connecting the ends of flexible tubes to provide a continuous smooth flow passage therethrough. The coupling includes a fitting on the end of each tube. Each fitting includes an insert having a tubular portion and an enlarged flange portion at one end. The tubular portion fits snugly within the end of the hose with the exposed face of the flange in readiness to receive abuttingly the face of the flange on the other fitting. The edges of the tubular portion of the inserts located within their respective tubes are feathered in a fine taper to merge smoothly with the inner surface of the flexible tube. Each insert is retained in place by an outer sleeve which surrounds the end of the tube and which has a flange about its mating end. The outer surfaces of the flange on the outer sleeves are tapered to enable a locking band to be drawn tightly about the tapered outer flange and draw the fittings closely together. The abutting surfaces of the inserts are of male-female configuration to provide an effective seal.

3,630,553

COUPLED JOINTS

George M. Foulger, Keighley, England, assignor to Smith & Johnson (Sales) Limited, Keighley, Yorkshire, England

Filed Feb. 16, 1970, Ser. No. 11,753
Int. Cl. F16l *23/00*
U.S. Cl. 285—340 4 Claims



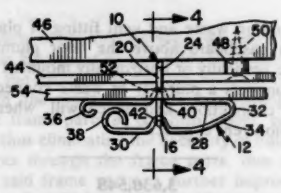
A joint connecting end-to-end pipe sections wherein there are two opposed flanges respectively having frustoconical faces whereby a frustoconical annular chamber is defined in which is located a rhomboidal sectioned gasket of which the parallel sides are both frustoconical and the cone angles of the gasket parallel sides and the flanges are inclined in the same direction with the flange face angle being largest so that the gasket when the joint is made takes up an "S"-shaped configuration with the crests of the "S" bearing respectively upon said opposed frustoconical faces of the flanges.

3,630,554

HANGER CLIP ASSEMBLY

Victor B. Cherniak, 1057 Madison Avenue, Chula Vista, Calif.

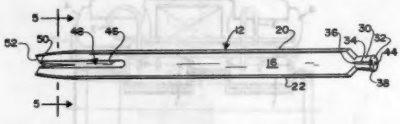
Filed Mar. 26, 1970, Ser. No. 22,975
Int. Cl. E04g *17/00*
U.S. Cl. 287—189.35 3 Claims



A hanger clip assembly comprising a clip for attachment between a supporting member and a structure to be supported, and a locking pin which is easily inserted and removed without tools. A looped portion of the clip passes through a hole in one of the structural elements, the locking pin fitting through the loop and having safe locking detent means. The locking pin will not work loose or become

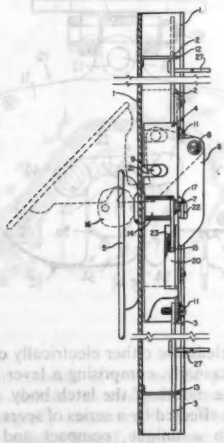
detached under normal stresses of the structure, but can be removed intentionally with a minimum of effort.

3,630,555
KNOT-TYING DEVICE
Charles E. Newlin, 3811-39th Avenue, Oakland, Calif.
Filed Sept. 4, 1970, Ser. No. 69,633
Int. Cl. D03j *3/00*
U.S. Cl. 289—17 **14 Claims**



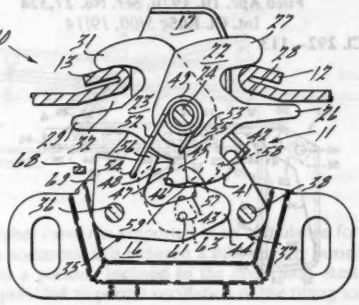
A knot-tying device, providing a mandrel mounted on a support member, the mandrel being formed with a surface-located slot and an aperture extending parallel to the slot, the mandrel being designed to aid in tying a knot in a cord by securing together an intermediate portion and an end portion of such cord.

3,630,556
HANDLE-CONTROLLED DOOR-LATCHING ARRANGEMENT FOR A CABINET
Ansano Bertellotti, Chicago, Ill., assignor to Automatic Electric Laboratories, Inc., Northlake, Ill.
Filed Dec. 26, 1967, Ser. No. 693,426
Int. Cl. E05c *9/10;* **E05b** *65/44*
U.S. Cl. 292—40 **1 Claim**



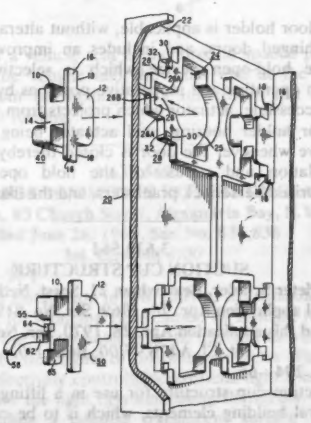
A handle-controlled door-latching arrangement, comprising a T-shaped handle mounted on the door of a cabinet, or enclosure, by inserting the leg portion of the T through a slot in the door and pivotally attaching the leg to a bracket secured inside the door along side the slot. A U-shaped rider, having a slot formed in the bottom and opposing notches formed in each side thereof, is mounted over the leg and bracket so that they protrude through the slot, with the side notches engaging each end of an actuating pin that is inserted through a hole in the leg of the T near the pivotal mounting. A door-latching bar is mounted to each end of the rider for engaging with or disengaging from portions attached to the cabinet, or enclosure, in response to a lever-type operation of the handle, to either latch the door in the closed position or unlatch it for subsequent opening. A key-operated rotary-type lock is mounted in the door adjacent the latching arrangement and is operated by the key for rotating a locking finger into engagement with a notch in the leg of the T to lock the arrangement in the latched position.

3,630,557
HOOD LATCH
Harold W. Pierce, 32932 Southgate St., and Thomas A. Pulleyblank, 18542 Fremont, both of, Livonia, Mich.
Filed May 26, 1970, Ser. No. 40,648
Int. Cl. E05c *3/28, 3/34*
U.S. Cl. 292—45 **10 Claims**



A latch assembly for releasably latching a hinged closure structure to a vehicle body compartment structure. The latch assembly comprises keeper elements engageable by latching levers of a latch mechanism. The latching levers, of which there are two, are paired with pawls effective to hold the levers in latched condition. Each of the latching levers and the respective pawl engageable therewith have opposed cam surfaces adapted to coact when the latching lever is moved toward latching position with its pawl displaced for any reason from latch lever holding position thereby to urge the pawl into such holding position.

3,630,558
QUICK-MOUNTING HARDWARE
John Andreini, Irvington, N.J.; Edwin Harley Borchard; Karl-Heinz Pohl, both of Boulder, Colo., and Joseph Anthony Puccio, East Brunswick, N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, Berkeley Heights, N.J.
Filed Aug. 28, 1970, Ser. No. 67,902
Int. Cl. E05c *19/06*
U.S. Cl. 292—87 **10 Claims**



each side of the opening. The hardware comprises a pair of spaced flanges joined by a hub, the flanges being spaced

apart the same distance as the thickness of the wall at the site of the opening. The hardware is positioned with the hub in the opening and the flanges straddling the wall, and the flanges include fingers that snap behind the wedge-shaped bosses to secure the hardware in place when the hub is positioned within a particular portion of the opening. One flange has a functional element extending therefrom.

3,630,559

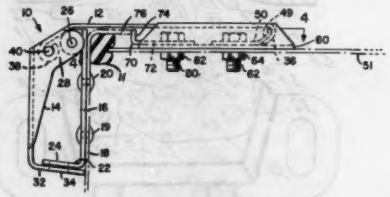
OVERCENTER DRAW LATCH

Walter B. Rawson, Chester, and Michael R. Tuozzo, Prospect Park, both of Pa., assignors to Southco, Inc., Lester, Pa.

Filed Apr. 10, 1970, Ser. No. 27,324

Int. Cl. E05c *5/00, 19/14*

U.S. Cl. 292—113 **6 Claims**



A 90° overcenter draw latch is provided with adjustable strike means to lock and control the amount of force which the latch exerts, and adjustable stop means to control the force exerted between the members being locked together. The device is made tamper-proof.

3,630,560

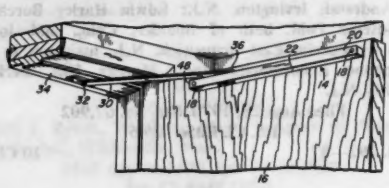
SURFACE-MOUNTED NONHANDED DOOR HOLDER

Norman C. Atkins, Franklin Park, and Henry J. Miller, Lincolnwood, both of Ill., assignors to Glynn Johnson Corporation, Chicago, Ill.

Filed Nov. 12, 1970, Ser. No. 88,685

Int. Cl. E05c *17/04*

U.S. Cl. 292—270 **29 Claims**



The door holder is applicable, without alteration, to right- or left-hinged doors, and includes an improved, manually operable hold-open device which is selectively movable between operative and inoperative positions by means of an easily accessible, actuator which projects from the bottom of the door holder housing, said actuator being rendered inoperative whenever the door is closed thereby discouraging manipulation and misuse of the hold open device by unauthorized personnel, pranksters, and the like.

3,630,561

SUCTION CUP STRUCTURE

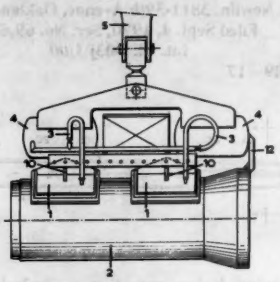
Jacob Pieter Schuler, Beatrixlaan 21, Soest, Netherlands

Original application Apr. 28, 1969, Ser. No. 819,667. Divided and this application Apr. 28, 1970, Ser. No. 48,582

Int. Cl. A47b *97/00;* **B66c** *1/02*

U.S. Cl. 294—65 **3 Claims**

A suction cup structure for use in a lifting device to lift structural building elements, which is to be connected to a vacuum source and comprises a rubber sealing ring mounted in a circular groove around the opening of the suction cup, the configuration of which cup conforms to the relevant surface portion of the object to be lifted, said ring consisting of



a plurality of layers of foam rubber succeeding each other from the inside to the outside about the opening of the cup, said layers being separated from each other by impenetrable layers of glue interconnecting the rubber layers.

3,630,562

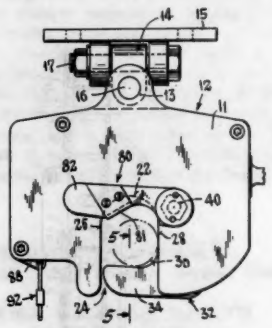
POWER OR MANUALLY RELEASED CARGO LATCH

Joseph R. Metz, c/o Norco Inc., P.O. Box 405, Georgetown, Conn.

Filed Dec. 24, 1969, Ser. No. 887,816

Int. Cl. B66c *1/34*

U.S. Cl. 294—83 **10 Claims**



A cargo latch releasable either electrically or at remote or proximal points manually, comprising a lever having an arm movable across the mouth of the latch body. Control of the lever movement is effected by a series of sears and secondary levers arranged in a unique, compact and advantageous manner to give positive action, great strength and at the same time easy release.

3,630,563

SELF-LOCKING GRIPPING HEAD

Bruno Jacksch, Wiesbaden, Germany, assignor to Firma W & M Automation Karl Muller, Wiesbaden, Germany

Filed Mar. 25, 1970, Ser. No. 22,435

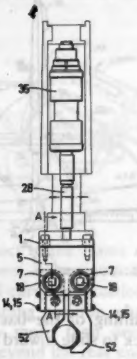
Claims priority, application Germany, Nov. 12, 1969, P 19 58 827.3

Int. Cl. B66c *1/62*

U.S. Cl. 294—88 **5 Claims**

A power-operated gripping head for lifting workpieces includes two pivotally mounted coacting jaws which are moved

toward and away from each other by a pair of pivotal levers



forming with a linearly movable actuator a toggle linkage which will lock the jaws in closed position.

3,630,564

VEHICLE BODY CONDUIT

Rudolph A. Ferrara, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 4, 1970, Ser. No. 34,439

Int. Cl. H01b *17/58*

U.S. Cl. 296—1 R **3 Claims**

An elongated conduit of a semirigid plastic for carrying electrical wires includes an elongated base and an elongated closure flap integrally connected to each other along respective elongated edges thereof. The base includes angularly disposed elongated walls respectively supported by angularly disposed walls of a rocker inner section of a vehicle floor pan assembly. Cooperating hooks on the flap and the base secure the flap in a closed position. The closed flap and the base jointly define an elongated cavity in which the wires are carried. The closed flap is normally concave with respect to the cavity transversely thereof but is flexibly movable outwardly thereof to increase the cross-sectional area of the cavity as required by the cross-sectional area of wires therein.

A modification includes an opening in the flap intermediate the ends of the conduit that allows regression of one or more wires from the cavity. The flap is flexed outwardly over the length of the conduit that carries the larger cross-sectional area of wires and is concave over the length of the conduit that carries the smaller cross-sectional area of wires.

3,630,565

STRETCHER SUPPORT APPARATUS FOR AN AMBULANCE

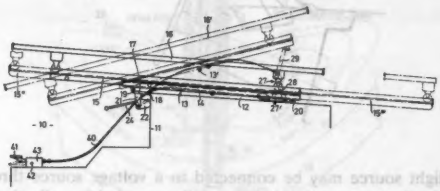
Ludwig Lehmann, Lorch, Wurttemberg, and Gustav Schieber, Leinzell, both of Germany, assignors to Binz & Co., Lorch, Wurttemberg, Germany

Filed June 26, 1969, Ser. No. 836,855

Claims priority, application Germany, July 18, 1968, P 17 66 783.3

Int. Cl. A61g *1/00*

U.S. Cl. 296—19 **21 Claims**



The stretcher carrier is supported in an ambulance for tilting about a horizontal axis between a substantially horizontal position and a position inclined to the horizontal. Resilient means are provided to permit oscillation of the tilting axis in substantial vertical direction. The arrangement may also include locking means movable to an operative position to prevent in this position such oscillations.

3,630,566

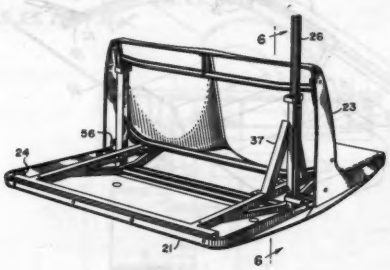
END-SUPPORTED VEHICLE SEAT

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed May 13, 1970, Ser. No. 36,842

Int. Cl. B60n *1/00*

U.S. Cl. 296—63 **7 Claims**



One end of a vehicle seat is anchored at spaced points to the wall of the vehicle and the other end at the aisle is suspended from the ceiling by a suspension rod or tube braced against turning.

3,630,567

DEVICE FOR MINIMIZING EFFECTS OF GLARE

Peter D. Cook, 93 Church Street, Alexandria Bay, N.Y.

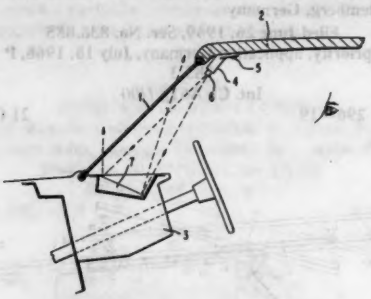
Filed June 26, 1969, Ser. No. 836,836

Int. Cl. B60j *3/00*

U.S. Cl. 296—97 F **1 Claim**

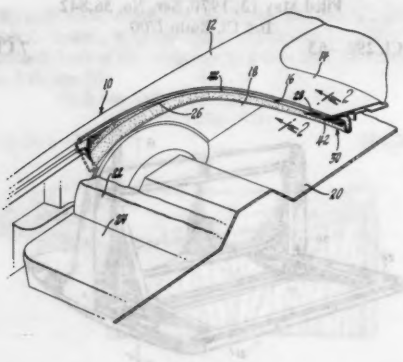
A device for installation in proximity to the windshield of a motor vehicle for reducing glare caused by sunlight reflected from parts of the motor vehicle in the daylight as well as the glare caused by headlights of oncoming vehicles after dark, including a selectively controllable artificial light source and a distributor for the light rays emanating therefrom, the distributor including a colored translucent surface through

which the light rays are directed over the surface of the windshield from the interior thereof. According to an alternative embodiment of the present invention, the artificial



light source may be connected to a voltage source through the foot-operated switch normally provided for adjusting the beam of the headlights.

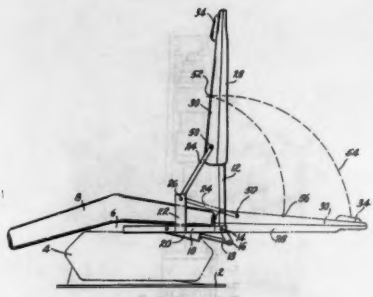
3,630,568
CONVERTIBLE TOP DRAIN GUTTER
Stanley Podwys, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed July 10, 1970, Ser. No. 53,907
Int. Cl. B60j *7/00*
U.S. Cl. 296—116 **1 Claim**



An elongated member of flexible material is looped between an edge of the body top well opening and a floating rear bow of the top when the top is in raised position to collect water flowing from the top within the storage well.

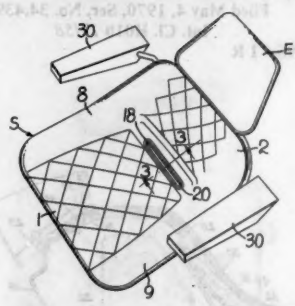
3,630,569
RECLINING CHAIR
Maurice Lory, Paris, France, assignor to Establissements Quetin, Paris, France
Filed Nov. 7, 1969, Ser. No. 874,797
Claims priority, application France, Nov. 20, 1968, 174,532
Int. Cl. A47c *3/00*; B60n *1/02*
U.S. Cl. 297—361 **3 Claims**

A chair having a seat and a back support pivoted to the seat on a fixed hinge axis adjacent the rear edge of the seat. A chair back is slidable along the back support toward and from the hinge axis. A link is pivoted at one end to the seat at a point forwardly of and above the hinge axis and is pivoted at its other end to the slidable chair back above the hinge



axis so that rearward tilting of the back support and seat back causes the seat back to slide toward the hinge axis.

3,630,570
BUCKET-TYPE SEAT HAVING DRAIN AND VENTILATING MEANS
Richard F. Swenson, Milwaukee, Wis., assignor to Swenson Corporation, Red Granite, Wis.
Filed Sept. 3, 1970, Ser. No. 69,410
Int. Cl. A47c *27/14*; B60n *1/02*
U.S. Cl. 297—453 **3 Claims**

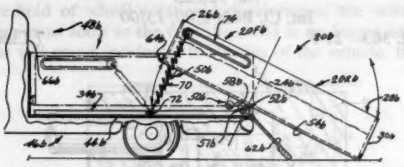


A bucket-type seat for tractors, earth-working vehicles, or the like, in which the seat and backrest are formed as an integral member, and having a pocket or recess adjacent the juncture between the seat and backrest portion and further, having opening means of considerable size in said recess. The integrally formed bucket seat has its seat, backrest and sides all inclined downwardly so as to drain into the seat recess and opening, and the position and construction of the recess is such that good ventilation is provided through the underside of the seat, even though the operator is occupying the seat.

3,630,571
AUXILIARY DUMPING APPARATUS FOR A VEHICLE
David G. Saldana, 15237 Lakeside St., Sylmar, Calif.
Filed Aug. 7, 1967, Ser. No. 658,670
Int. Cl. B60p *1/30*; B65g *67/32*; B60p *1/00*
U.S. Cl. 298—14 **11 Claims**

The specification discloses a dumping apparatus adapted to be mounted in or on the body of a vehicle, such as a pickup truck, station wagon, or the like, and includes a chamber-defining container structure adapted to be slidably mounted on a container mounting and supporting frame, rail,

or track means which is adapted to be fixedly mounted in a substantially horizontal manner with respect to a body portion of a vehicle. For example, the frame means may be mounted on the bed of a pickup truck or on the floor of a station wagon or the like. The container structure is slidably



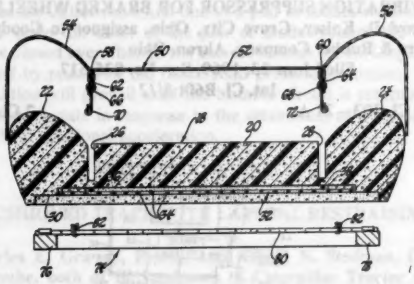
mounted with respect to the frame or rail means referred to above for movement between a forwardly extreme load-receiving and load-carrying position and a rearwardly extreme preload-dumping position where a substantial portion of (usually slightly more than one-half of) the container structure extends beyond the rear end of the frame.

3,630,572

SEAT ASSEMBLY

Robert I. Homier, Farmington, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Sept. 23, 1969, Ser. No. 860,291
Int. Cl. A47c *7/02, 27/00, 23/00*
U.S. Cl. 297—454 **4 Claims**



A seat assembly comprising a molded foam cushion having laterally spaced bolster portions, a molded plastic pad secured to the bottom of the cushion and having a fine grid and at least two heavy strands. There are openings in the cushion directly above the heavy strands which locate and receive hooks for securing a trim cover to the heavy strands through the cushion. The cushion is secured to a seat frame having seat surface springs.

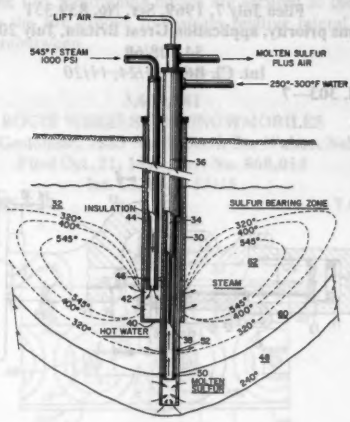
3,630,573

SULFUR MINING WITH STEAM

Clifton S. Goddin, Jr., and Karol L. Hujsak, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Dec. 19, 1969, Ser. No. 886,510
Int. Cl. E21b *43/28*
U.S. Cl. 299—6 **7 Claims**

This is an improvement and modification of the Frasch-type underground sulfur-mining process. The primary source of heat is steam with temperature up to 600°–800° F. which is injected into the sulfur deposit. Hot water at a temperature above 240° but not over 320° F. is injected below the steam. The steam zone is surrounded by an advancing zone of hot condensate within which melting of the sulfur occurs in a temperature range of 240°–320° F. The molten sulfur flows by gravity towards the central production tubing intake and is insulated from the hot injected steam by a blanket of hot



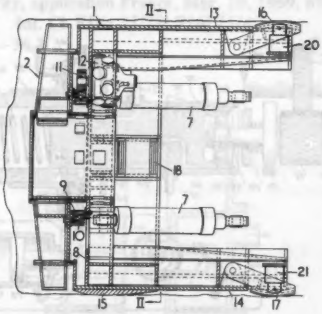
water. Reduced water requirement per ton of sulfur and higher thermal efficiency are effected by this process.

3,630,574

TUNNELING MACHINE WITH STEERING SHIELD

Alan James Cox, Rochester, Kent, and Roy Patrick Burgess, Tunbridge Wells, Kent, both of England, assignors to Edmund Nuttall & Sons & Co. (London) Limited, London, England

Filed Feb. 26, 1970, Ser. No. 14,339
Claims priority, application Great Britain, Mar. 3, 1969, 11,316/69
Int. Cl. E01g *3/04*
U.S. Cl. 299—31 **6 Claims**



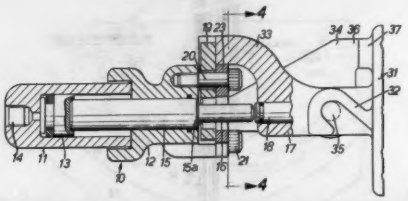
A tunneling machine, primarily for use in tunneling through hard ground. A digging assembly of conventional nature is mounted on a shield, but contrary to normal practice, the shield is smaller in radius than the tunnel cut by the digging assembly. At the forward end of the underside the shield is provided with a rocking pad on which the whole shield and digging assembly is bodily rockable to steer the machine. The rocking is achieved by pressing members, e.g. in the form of jacks, mounted in the shield and adapted to press against the tunnel wall.

3,630,575

COUPLING MEANS FOR HYDRAULIC BRAKE SYSTEMS

Richard T. Fowler, Redditch, Worcestershire, England, assignor to Girling Limited, Tyseley, Birmingham, England

Filed July 7, 1969, Ser. No. 839,331
Claims priority, application Great Britain, July 20, 1968, 34,708/68
Int. Cl. B60t 11/24, 11/20
U.S. Cl. 303—7 2 Claims



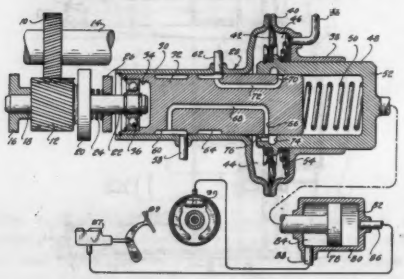
The tractor part of a coupling between the braking systems of a tractor and trailer is an auxiliary piston and cylinder, the cylinder carrying a safety member which prevents movement of the piston in the brake-applying direction when the coupling is disconnected and forms part of the means for connecting the coupling.

3,630,576

ANTISKID BRAKE ACTUATOR FOR VEHICLE WHEEL BRAKES

Achille C. Sampietro, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 16, 1970, Ser. No. 11,632
Int. Cl. B60t 8/16
U.S. Cl. 303—21 CG 1 Claim



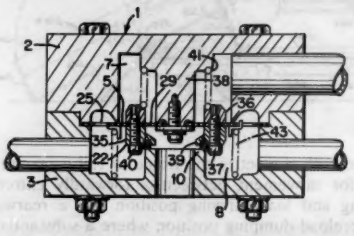
An actuator for a vehicle wheel brake system which responds to changes in the algebraic sum of two opposing inertia forces, one inertia force being proportional to linear deceleration during braking and the other being proportional to angular deceleration of a vehicle wheel, said actuator being adapted to modify the effect of wheel brake pressure in the wheel brake servos associated with the deceleration sensor thereby providing wheel brake pressure modulation that is proportional in magnitude to the net value of the deceleration of the system.

3,630,577

VEHICLE ANTISKID BRAKING SYSTEMS

John Walter Davis, 5 Hathaway Close, Balsall Common, Coventry CV7, 7EP, Warwickshire, England

Original application Sept. 23, 1968, Ser. No. 761,681, now abandoned. Divided and this application Nov. 25, 1970, Ser. No. 92,823
Int. Cl. B60t 8/00, 15/00
U.S. Cl. 303—21 F 7 Claims



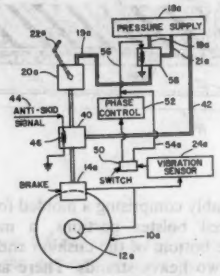
A valve having an annular inlet valve seat and an annular exhaust valve seat arranged concentrically and a flap valve diaphragm which is engageable at its outer peripheral portion with the inlet seat and at its central portion with the exhaust seat and which can flex to uncover either the inlet seat or the exhaust seat, a stem being secured to the flap valve diaphragm and to a second diaphragm and being arranged to balance the pressures acting on the flap valve diaphragm.

3,630,578

VIBRATION SUPPRESSOR FOR BRAKED WHEELS

Willard D. Kaiser, Grove City, Ohio, assignor to Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 23, 1969, Ser. No. 835,517
Int. Cl. B60t 8/12
U.S. Cl. 303—21 A 7 Claims



The invention modulates the braking force as a function of the motion or vibration of the carrying axle or supporting structure for a braked wheel or wheels. Any suitable means to sense the motion is utilized with the output of this means actually modulating the brake pressure to the brake system to provide for the vibration suppression.

3,630,579

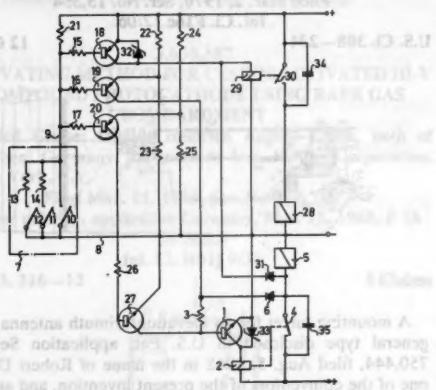
ANTILOCKING CONTROL SYSTEM

Anton Rodi, Karlsruhe, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Sept. 2, 1969, Ser. No. 854,462
Claims priority, application Germany, Sept. 4, 1968, P 17 80 348.4
Int. Cl. B60t 8/12
U.S. Cl. 303—21 BE 2 Claims

A vehicle brake antilocking control system which includes a normally open inlet valve allowing the brake fluid pressure

developed at the master cylinder to be applied to the wheel brake system, and a normally closed outlet valve for reducing the brake fluid pressure at the wheel brake system. When the brakes are applied and a first threshold of wheel rotational deceleration is reached, the inlet valve is closed to maintain a constant brake fluid pressure at the wheel brake system. If this constant pressure is insufficient to attain a second threshold of wheel rotational deceleration, the inlet valve reopens as soon as the first threshold is no longer attained—as will occur incidental to slowing of the vehicle. If, however, the constant pressure is sufficient to attain the second deceleration threshold, the state of a bistable circuit controlling the outlet valve is changed. This change of state opens the outlet valve and one of a pair of diodes retains this state while the other of the pair of diodes retains the inlet valve closed even though the two thresholds are no longer attained by reason of the brake fluid pressure reduction. This condition will prevail until the bistable circuit is returned to its normal state in response to the attainment of a threshold of wheel rotational acceleration.

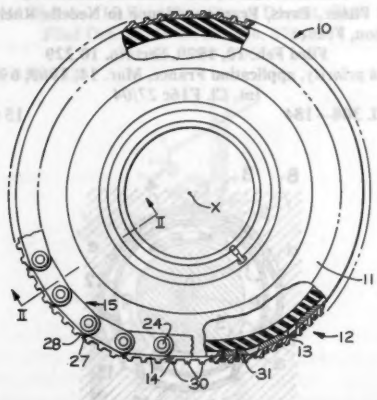


3,630,580

CUSHIONED TRACK WITH LATERAL RESTRAINING MEANS

Charles E. Grawey, Peoria, and Robert N. Stedman, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 22, 1970, Ser. No. 48,285
Int. Cl. B62d *65/16*
U.S. Cl. 305—19 **20 Claims**



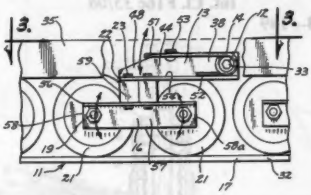
A resilient spacer means, such as a pneumatic rubber tire, has a circumferentially disposed groove formed on the periphery thereof. An endless track assembly is entrained around the tire and comprises a plurality of closely coupled ground-engaging track shoes connected together by two annular and articulated link assemblies positioned on opposite sides of the tire. Restraining means are secured to the shoes to engage the tire groove to restrain relative lateral movements therebetween.

3,630,581

BOGIE WHEELS FOR SNOWMOBILES

Frank T. Gostomski, 1053 North Beech St., Wahoo, Nebr.

Filed Oct. 21, 1969, Ser. No. 868,014
Int. Cl. B62d *55/16*
U.S. Cl. 305—27 **7 Claims**



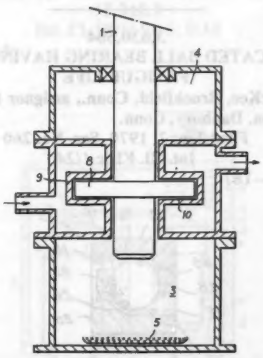
A bogie wheel system adapted for use with snowmobiles is provided herein. The bogie wheel system comprises elongate first members rotatably mounted at one end on a support means and coil springs normally urging the other end of the first members downwardly. Second members are aligned with the first members and aligned with the track of the snowmobile and have axles mounted transversely of the track with bogie wheels rotatably mounted thereon. Resilient members are disposed between the first members and the second members and means are provided for securing them in aligned relation.

3,630,582

SEALING JOINTS

Jacques Maire, Epinay-sur-Seine; Robert Gremion, Saint-Leu-la-Foret, and Jean Lemaire, Saint-Denis, all of France, assignors to Le Carbone-Lorraine, Paris, France

Filed Mar. 3, 1970, Ser. No. 16,003
Claims priority, application France, Mar. 10, 1969, 6906583
Int. Cl. F16c *33/78;* **F16j** *15/40*
U.S. Cl. 308—36.3 **7 Claims**



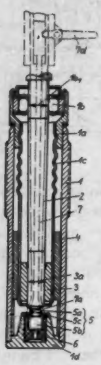
This invention relates to sealing joints, for example, for preventing leakage of a fluid from one part of a machine to another via relatively rotating members such as a shaft and a bearing therefor. According to the invention, the sealing joint comprises a barrier means that is formed from the fluid itself, from one of its components and from a body in contact with

the fluid to be sealed. The barrier means advantageously comprises the condensate of a condensable body and this body may either be contained within the fluid to be sealed or it may be introduced between the said fluid and an exterior fluid. The formation of the condensate can be effected by cooling appropriate parts of the system.

3,630,583
BEARING SUPPORT OF SPINDLES FOR SPINNING AND TWISTING MACHINES

Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Spindelfabrik Suben, Schurr, Stahlecker & Grill G.m.b.H.

Filed Aug. 6, 1969, Ser. No. 848,043
Claims priority, application Germany, Aug. 6, 1968, Mar. 4, 1969; P 17 85 061.2, P 19 11 025.9
Int. Cl. F16c *35/08*
U.S. Cl. 308—149 **10 Claims**

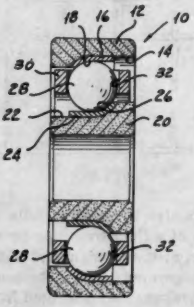


A bearing support of spindles for spinning and twisting machines in which the rotating spindle shaft is adapted to be pulled out of the spindle and in which the spindle shaft is supported by a collar bearing absorbing radial pressures and by a footstep bearing absorbing both axial and radial pressures; at least the bearing part of the footstep bearing which absorbs the axial pressures is disengageably arranged in the spindle in such a manner that it can be assembled and disassembled through the bearing bore of the collar bearing; additionally, this bearing part may be provided with engaging surfaces for an assembly tool.

3,630,584
LUBRICATED BALL BEARING HAVING LONG FATIGUE LIFE

Lewis W. McKee, Brookfield, Conn., assignor to The Bayden Corporation, Danbury, Conn.

Filed Jan. 2, 1970, Ser. No. 260
Int. Cl. F16c *1/24*
U.S. Cl. 308—187 **11 Claims**

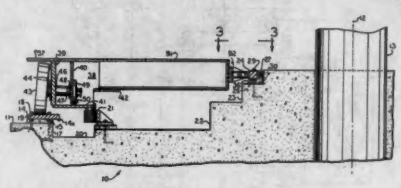


A bearing assembly in which porous lubricant retaining inner and outer rings receive raceway-providing inserts formed from sheet steel alloy bonded in place in recesses in the rings.

3,630,585
MOUNTING TURRET FOR ELEVATION/AZIMUTH ANTENNA

Robert Dale Hall, La Mesa, and Salvatore A. Rocci, El Cajon, both of Calif., assignors to Rohr Corporation, Chula Vista, Calif.

Filed Mar. 2, 1970, Ser. No. 15,354
Int. Cl. F16c *17/06*
U.S. Cl. 308—231 **12 Claims**

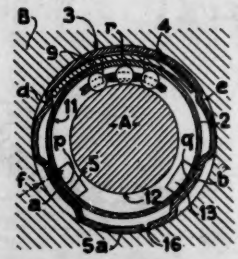


A mounting turret for an elevation/azimuth antenna of the general type disclosed in U.S. Pat. application Ser. No. 750,444, filed Aug. 5, 1968 in the name of Robert D. Hall, one of the coinventors of the present invention, and assigned to the assignee of the present invention, is supported for rotative adjustment about an azimuth axis by wheels, which are mounted on the turret for rolling movement around an annular track mounted in a horizontal plane with its axis substantially coincident with a selected azimuth axis. A bull gear for rotatively driving the turret is fixedly mounted on the base coaxially with the annular/track, and spaced radially inwardly therefrom. A pair of power driven pinions mounted on the turret are in mesh with the bull gear for rotatively adjusting the turret. For maintaining the turret with its axis coincident with the selected azimuth axis, a bearing ring is mounted on the base with its axis exactly coincident with the azimuth axis, and a plurality of bearing pads, mounted on the turret are in bearing relation with the bearing ring. Holddown means for countering tilting moments imposed on the turret by the weight of an antenna mounted on the turret comprise a plurality of holddown wheels on the turret and in preloaded rolling engagement with the under side of an exposed marginal portion of the annular track.

3,630,586
CLEARANCE-FREE NEEDLE BEARING

Alfred Pitner, Paris, France, assignor to Nedella Rueil, Malmaison, France

Filed Feb. 10, 1970, Ser. No. 10,229
Claims priority, application France, Mar. 14, 1969, 6907276
Int. Cl. F16c *27/04*
U.S. Cl. 308—184 **15 Claims**



Needle bearing one of the raceways of which is formed on a thin ring. The latter comprises angularly spaced zones

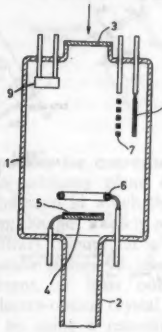
which are subjected to an elastic radially inward deformation by application of these zones on supports afforded by a sleeve concentric with the ring. This sleeve is mounted in the bore of the bearing housing. The sleeve has at least one rigid support in the form of a pressure dished portion bearing on the bore, and at least one elastically yieldable support constituted by an arcuate element show whose radius of curvature exceeds that the ring and that of the bore and which bears at its ends against said bore. The arcuate element is urged radially at its crest into contact with the ring.

3,630,587

ACTIVATING METHOD FOR CESIUM ACTIVATED III-V COMPOUND PHOTOCATHODE USING RARE GAS BOMBARDMENT

Siegfried Garbe; Gunter Heinrich August Frank, both of Aachen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1969, Ser. No. 806,192
Claims priority, application Germany, Mar. 15, 1968, P 16 39 363.8
Int. Cl. H01j *9/38*
U.S. Cl. 316—12 **5 Claims**



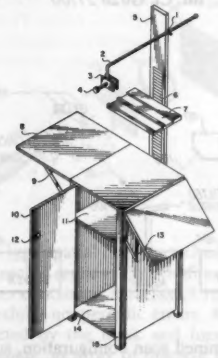
A method for activating a cesium-activated III-V compound photocathode is described. Prior to covering with the cesium, the cathode surface is subjected to intensive cleaning by heating for several hours at a maximum temperature of 300° C. and then the surface is bombarded with slow rare gas ions.

3,630,588

ARTISTS' EASY COMPACT EASEL

Minnie M. Baker, 615 West Pine Street, Durant, Okla.

Filed Oct. 22, 1969, Ser. No. 870,390
Int. Cl. A47f *3/06*
U.S. Cl. 312—231 **1 Claim**



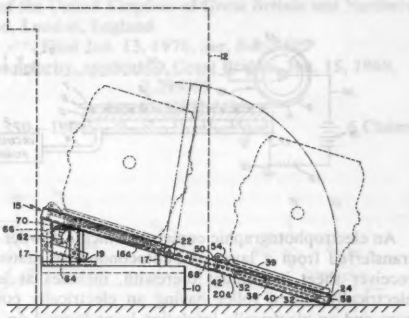
An artist's easy compact easel having an adjustable canvas support extending from the back of a supporting cabinet. The cabinet is provided with a three-section adjustable top forming a palette having a white formica surface for mixing colors thereon and avoiding visual absorption of their intensities.

3,630,589

SERVING COUNTER WITH A BEER KEG HANDLING APPARATUS

Arthur A. Plate, 9216 North 9th Ave, Phoenix, Ariz.

Filed Dec. 11, 1968, Ser. No. 782,826
Int. Cl. B65g *1/04*
U.S. Cl. 312—270 **14 Claims**



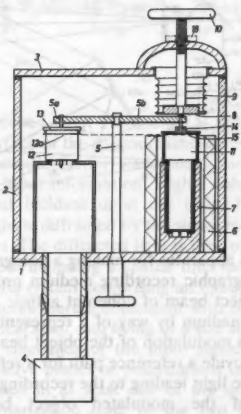
A beer keg handling mechanism is utilized for transporting a beer keg into its storage position within a cabinet. The mechanism comprises a two-section ramp, a fixed section within the cabinet, and a pivoted section tiltable 90° from its ramp position outside the cabinet to a generally upright position within the cabinet. The ramps provide rails on which a wheeled pulley-driven keg-supporting truck rides.

3,630,590

METHOD FOR TRANSFERRING LAYERS PRODUCED IN A VACUUM

Heinrich Strubig, Darmstadt; Werner Tretner, Weiterstadt, and Gunter Flasche, Darmstadt, all of Germany, assignors to Fernseh GmbH, Darmstadt, Germany

Filed Mar. 13, 1970, Ser. No. 19,421
Claims priority, application Germany, Mar. 27, 1969, P 19 15 710.9
Int. Cl. H01j *9/18, 9/38*
U.S. Cl. 316—4 **10 Claims**



Method for constructing operational layers, such as photosensitive layers, outside the operational containers,

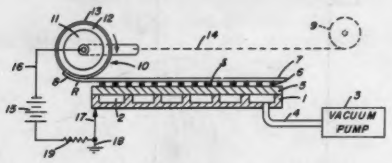
such as camera tubes, in which they are to be used ultimately, testing the layers, then transferring them to the operational containers.

3,630,591

ELECTROPHOTOGRAPHIC RECEIVER SHEET PICKUP METHOD AND APPARATUS

Donald R. Eastman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1969, Ser. No. 873,894
Int. Cl. G03g 15/00
U.S. Cl. 355—3 **8 Claims**



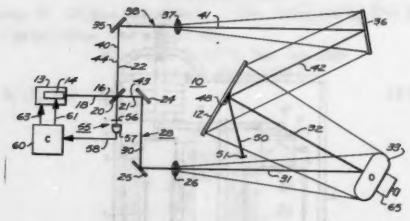
An electrophotographic copier, in which a powder image is transferred from a layer of photoconductive material to a receiver sheet in contact therewith, includes at least one electrically biased roller having an electrically conductive core and an electrically insulating layer formed on and surrounding the core. As the roller and the receiver sheet are moved relative to one another, the roller picks up the receiver sheet for subsequent transport through the copier and, at the same time, effects transfer of the powder image to the receiver sheet. In another embodiment, two biased rollers are used, one to effect transfer of the powder image to the receiver sheet and the other to pick up or strip the receiver sheet from the photoconductive material for guiding it into a designated path of further movement through the copier.

3,630,592

METHOD AND APPARATUS FOR DETERMINING ENVIRONMENT CONDUCIVE FOR RECORDING INTERFERENCE PATTERNS AND HOLOGRAPHICALLY RECORDING

Dexter P. Cooper, Jr., Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Mar. 30, 1970, Ser. No. 23,536
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 **25 Claims**



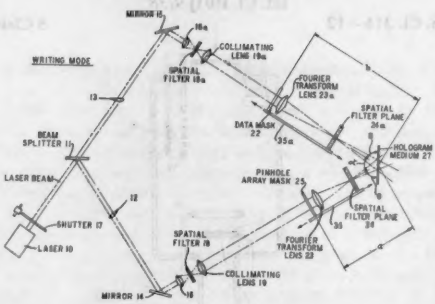
Methods and apparatus for making a hologram of information on a holographic recording medium provide an object path for an object beam of coherent actinic light leading to the recording medium by way of a representative of the information for a modulation of the object beam by the information, and provide a reference path for a reference beam of coherent actinic light leading to the recording medium for an interference of the modulated object beam with the reference beam and a recording of resulting interference patterns on the recording medium. Beams of coherent inert light are provided and transmitted on the object and reference paths, and a control signal indicating an instant at which conditions in the object and reference paths permit to an establishment and recording of the mentioned interference patterns are provided in response to the transmitted beams of inert light. The requisite object and reference beams are transmitted along the object and reference paths, respectively, in response to the signal indicating the latter instant for an establishment and recording of the interference patterns.

3,630,593

HOLOGRAPHICALLY PRODUCED IMAGE ARRAYS FOR PHOTOLITHOGRAPHY

John Lester Bartelt, Maplewood, and Robert Kyran Curran, Stirling, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed May 8, 1970, Ser. No. 35,633
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 **3 Claims**



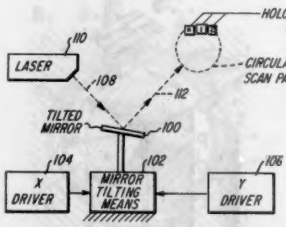
This disclosure describes the generation of multiple identical images holographically. Wavefronts from a unit pattern and a pinhole array separately illuminated by branched, spatially filtered and collimated laser beams are Fourier-transformed and focused in front of a holographic medium. Illumination of the developed hologram with a laser beam conjugate to the wavefront from one of the pinholes produces a spaced array of real images of the unit pattern. The process is useful in photomask making, or as a way to directly expose photoresist in silicon device manufacture.

3,630,594

HOLOGRAPHIC SCAN CONVERTER

Istvan Gorog, Princeton, N.J., assignor to RCA Corporation

Filed May 25, 1970, Ser. No. 40,111
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 **6 Claims**



A first predetermined scan configuration, such as a circular scan for instance, of wave energy is converted into a different second predetermined scan configuration, such as a

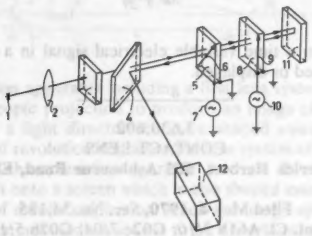
straight line for instance, of wave energy by means of a plurality of separate holograms.

3,630,595

APPARATUS FOR CONVERTING LINEARLY POLARIZED RADIATION INTO LINEARLY POLARIZED RADIATION HAVING A PLANE OF POLARIZATION VARYING LINEARLY WITH TIME

Theodorus Hendrikus Peek, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,634
Claims priority, application Netherlands, Feb. 3, 1969, 6901722
Int. Cl. G02f 1/26
U.S. Cl. 350—150 3 Claims



An improved apparatus for converting linearly polarized radiation having an arbitrary plane of polarization into linearly polarized radiation in which the orientation of the plane of polarization changes linearly as a function of time from the initial arbitrary orientation is discussed, in which apparatus the radiation passes at least thrice through a birefringement element, at least one of the elements traversed being an electro-optical crystal.

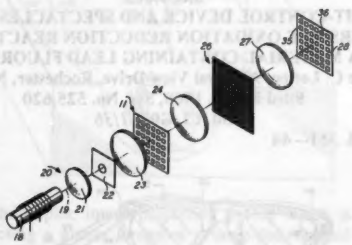
It is shown that by using a retrodirective element the number of birefringement elements can be reduced and also the voltage to be applied to the electro-optical crystals can be considerably lower.

3,630,596

PHOTOMASK REGENERATION BY INTENSITY SPATIAL FILTERING

Laurence S. Watkins, Highstown, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,358
Int. Cl. G02b 27/38
U.S. Cl. 350—162 SF 5 Claims



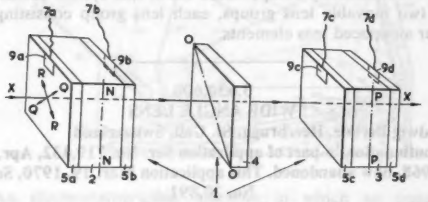
An intensity-type spatial filtering technique is employed to generate a corrected replica of a two-dimensional photomask or other pattern containing an array of regularly spaced elements which exhibit nonperiodic errors. A coherent beam of light is diffracted by the mask and focused onto a transparency containing an array of discrete transparent regions against an opaque background. The regions are spaced by a distance inversely proportional to the element spacing on the pattern. The focused light is spatially modulated by the transparency to suppress nonperiodic information contained in the focused light. The spatially modulated light transmitted by the filter is refocused on a photosensitive film which, when developed, defines an array of elements corresponding exactly to the array on the test pattern with the nonperiodic errors removed.

3,630,597

ELECTRO-OPTIC DEVICES

Kenneth Fraser Hulme, Malvern, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jan. 13, 1970, Ser. No. 2,509
Claims priority, application Great Britain, Jan. 15, 1969, 2,299/69
Int. Cl. G02f 1/26
U.S. Cl. 350—150 6 Claims



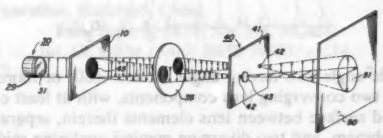
An electro-optic modulating device comprises a modulating element which comprises a longitudinal electro-optic crystal having transparent conducting electrodes defining a radiation path oblique to the X, Y and Z directions of the crystal.

3,630,598

OPTICAL DEMODULATION FILTER

William S. Little, Jr., Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Jan. 2, 1970, Ser. No. 332
Int. Cl. G02f 2/00
U.S. Cl. 350—157 9 Claims



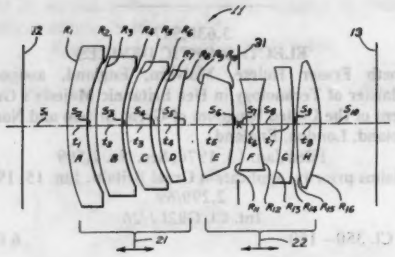
Optically screened input information is recorded as excursions on the surface of the thermoplastic film. The excursions consist of a periodic carrier wave and a modulating signal containing the input information. Highly coherent polarized light is directed incident upon the image-bearing surface whereby the light is diffracted by the signal-modulated deformations thereon. The diffracted light is then passed through a projection system including a spatial filter positioned in the focal plane of the system comprising an opaque mask having two clear apertures therein coincident with the two first diffracted order focal spots and being of a size sufficient to pass the modulated sidebands of the input signal. A device for rotating the relative planes of polarizations of the diffracted light is positioned in at least one of the diffracted beams wherein the polarization state of the two diffracted light beams are orthogonal at the scan plane of the system.

3,630,599

MECHANICALLY COMPENSATED ZOOM LENS SYSTEM

Roscoe J. Donnel, Glendale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 21, 1970, Ser. No. 82,662
Int. Cl. G02b *15/14*
U.S. Cl. 350—184 **5 Claims**



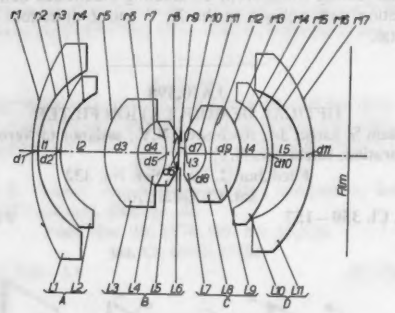
A mechanically compensated zoom lens system consisting of two movable lens groups, each lens group consisting of four air-spaced lens elements.

3,630,600

WIDE ANGLE LENS

Ludwig Bertele, Heerbrugg, St. Gall, Switzerland

Continuation-in-part of application Ser. No. 719,432, Apr. 8, 1968, now abandoned. This application Mar. 19, 1970, Ser. No. 20,891
Claims priority, application Switzerland, Apr. 14, 1967, 5413/67
Int. Cl. G02b *9/62, 9/34*
U.S. Cl. 350—215 **5 Claims**



Wide angle lens having angle of view ±60° or more comprises two converging lens components, with at least one cemented surface between lens elements therein, separated by a diaphragm, and two diverging menisci enclosing said components and diaphragm, the menisci concave facing the diaphragm. The convex outer surface of the component on the image side of the diaphragm faces away from the latter and has greater curvature than the preceding cemented surface. The convex side of said preceding cemented surface faces the diaphragm and has a lower refractive index on its diaphragm side than on its image side.

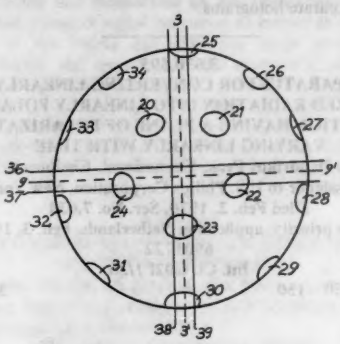
3,630,601

PHOTOELECTRIC REGISTRATION OF BALL ROTATION AS TEACHING AID FOR BALL GAMES

Kurt Lehovec, 11 Woodlawn Drive, Williamstown, Mass.

Filed Feb. 24, 1969, Ser. No. 801,396
Int. Cl. G02b *27/32*; G01f *15/14*
U.S. Cl. 356—256 **8 Claims**

The ball is provided with a surface pattern of regions of different optical properties. Light reflected from the moving ball is modulated by the rotation of these regions, transformed into a time variable electrical signal in a photocell, and recorded or displayed.

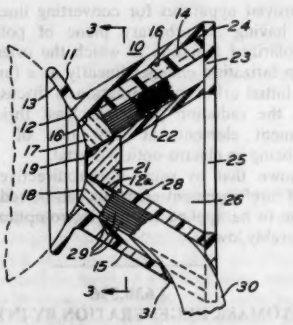


3,630,602

CONTACT LENS

John Frederick Herbert, 605 Ashbourne Road, Elkins Park, Pa.

Filed May 4, 1970, Ser. No. 34,185
Int. Cl. A61b *3/10*; G02c *7/04*; G02b *5/14*
U.S. Cl. 351—16 **3 Claims**



A contact lens is provided having an illuminator with high light input without heating effect and which is particularly suited for illumination of the interior of the eye for examination of the eye and photography of the eye.

3,630,603

LIGHT-CONTROL DEVICE AND SPECTACLES USING REVERSIBLE OXIDATION REDUCTION REACTIONS IN A MATERIAL CONTAINING LEAD FLUORIDE

Eugene C. Letter, 90 Royal View Drive, Rochester, N.Y.

Filed Feb. 7, 1966, Ser. No. 525,620
Int. Cl. G02f *1/36*
U.S. Cl. 351—44 **7 Claims**

Disclosed is an optical device comprising a pair of electron conducting electrodes separated by a solid-state electrolytic

layer containing ions available for reversible oxidation and reduction reactions in response to an electrical potential applied across the electrodes.

3,630,604

OPTICAL PROJECTION APPARATUS

Wendell S. Miller, 1341 Comstock Ave., Los Angeles, Calif.

Continuation-in-part of application Ser. No. 645,721, June 13, 1967, now abandoned. This application Feb. 16, 1970, Ser. No. 10,170

Int. Cl. G03b *21/28*

U.S. Cl. 353—99 30 Claims

Projection apparatus including a first lens system operable by orthoscopic projection to produce an image of an optical object on a light director structure shaped essentially as a conicoid of revolution and a second lens system of prescribed distortion characteristics operable to view the image and reproject it onto a screen which is also shaped essentially as a conicoid of revolution, but on which the image appears from a predetermined audience area to be an orthoscopic projection of the optical object. Preferably, the two conicoids have a common axis of revolution, with the two projection lenses and the optimum viewing location being positioned on that axis. In general, the director structure has a large number of reflective facets which are so oriented as to direct the light of the image thereon primarily along converging paths and in concentrated form toward the second lens system. In one particular case these facets may fuse into a smooth condensing reflector.

3,630,605

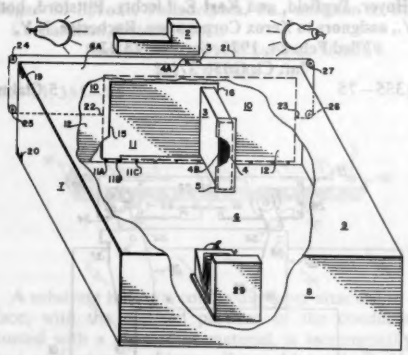
ORTHOGRAPHIC IMAGE-PROJECTING DEVICE

Joseph H. Lock, 520 Villa Ave. S.E., Mableton, Ga.

Filed Jan. 19, 1970, Ser. No. 3,953

Int. Cl. G03b *27/48*

U.S. Cl. 355—1 4 Claims



An orthographic image-projecting device which is useful for projecting a planar image of a three-dimensional object comprises a source of radiation arranged so that the rays from the source are reflected from the object, directional ray transmission means disposed in the path of rays reflected from the object and a arranged to transmit reflected rays in one general direction, image-producing means responsive to rays emitted by the ray transmission means and image recording means which may be in the form of a device which records the image produced on the image-producing means. A scanning mechanism imparts movement to the directional ray transmission means which is transverse to the direction of transmission of rays therethrough and a radiationtight enclosure is disposed about the image-recording device and the image-producing device. For some applications of the invention the so-called image-producing means may be eliminated and the rays from the ray transmission means may be directed onto an image-recording means.

3,630,606

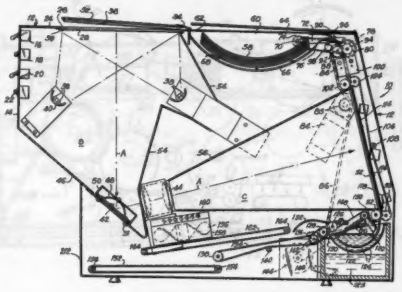
ELECTROPHOTOGRAPHIC SYSTEM

Ira M. Sage, New York, N.Y., assignor to Pitney Bowes-Sage, Inc.

Filed Mar. 28, 1966, Ser. No. 537,881

Int. Cl. G03g *15/04*

U.S. Cl. 355—3 14 Claims



An electrostatographic machine in which an opaque original is lit by flashlamps to modulate the reflected light beam which is cast by an optical system onto a moving charged copy sheet so as to leave a latent electrostatic image thereon, which then is developed in a liquid toner bath. The leading edge of the copy sheet moving through the machine triggers the flashlamps. The copy sheet is fed from a magazine to an intermediate station immediately preceding the exposure station where the copy sheet awaits the start of a cycle of operations. At the exposure station, the copy sheet is urged against a glass plane by a repelling charge and by belts.

3,630,607

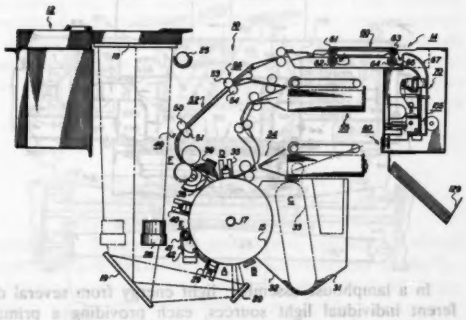
SET SEPARATION COPIER SYSTEM

Homer Korn, Webster; Stephen J. Greenfield, and Denis J. Stemmle, both of Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 9, 1970, Ser. No. 70,834

Int. Cl. G03g *15/00;* B65h *39/00, 31/34*

U.S. Cl. 355—6 7 Claims



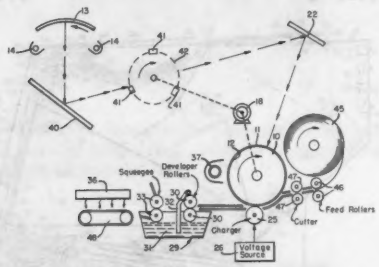
A system for producing sets of copies from documents that are copied in repeated cycles. A transport delivers copies to an intermediate tray which collects them in a set and then

separates each set from a previous set in offset fashion. A control logic provides for different modes of operation in which there is a book mode of operation and a normal copying operation and also provides appropriate signals for the offsetting of the sets as well as ejection of the sets into an output tray.

3,630,608
HIGH-SPEED COPIER

Ira M. Sage, New York, N.Y., assignor to Pitney Bowes-Sage, Inc.

Filed Nov. 14, 1968, Ser. No. 775,719
Int. Cl. G03g *15/04, 15/18*
U.S. Cl. 355—8 **1 Claim**

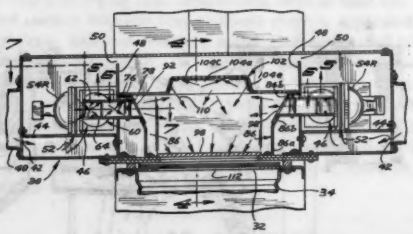


A latent image formed in a photoconductor surface carried on a conductive base is transferred to a sheet of untreated paper by placing said sheet in contact with said surface and imposing a high-voltage potential between the sheet and base. A charge image is thus formed in the sheet of paper corresponding to the latent image in the photoconductor surface, and this charge image is thereafter developed. These lenses are rotatably mounted such that the lenses rotate successively into the optical path for transmitting the image being scanned to the photoconductive surface.

3,630,609
LAMPHOUSE WITH PREMIXING

Roy A. Clapp, Coon Rapids; Haven Douglas Noble, Robbinsdale, and Douglas L. Haviland, Minneapolis, all of Minn., assignors to Nord Photo Engineering, Inc., Minneapolis, Minn.

Filed Feb. 13, 1969, Ser. No. 798,916
Int. Cl. G03b *27/54*
U.S. Cl. 355—37 **20 Claims**

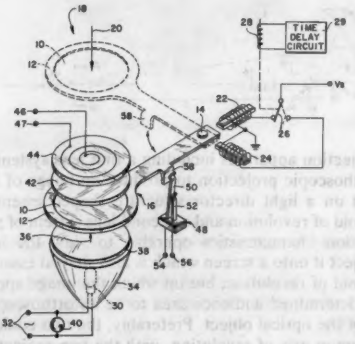


In a lamphouse assembly, light energy from several different individual light sources, each providing a primary color, is premixed and then introduced into a main mixing chamber through a rod screen, there being one such screen for each premixing chamber. The main mixing chamber is provided with an upwardly recessed roof and is further configured so that a highly diffused and uniform field of light is directed downwardly through the emission opening onto the printing paper.

3,630,610
COLOR FILTER MONITOR

William C. Klein, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,300
Int. Cl. G03b *27/76*
U.S. Cl. 355—71 **13 Claims**

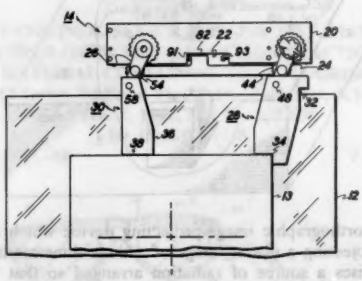


The operative condition of an element such as a color filter employed in color printing apparatus is monitored by a sensing device that indicates when the element becomes inoperative. In a color printer, color filters are employed that are adapted to be moved from a rest position to a printing position in the path of the printing beam to affect the color composition of the printing beam. A sensing device is operative when the filter is moved into the rest position to detect a variance in the color transmission of the filter and alert the operator of the color printer of the variance.

3,630,611
DOCUMENT REGISTRATION APPARATUS

August Hoyer, Penfield, and Karl E. Liechty, Pittsford, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,421
Int. Cl. G03b *27/62*
U.S. Cl. 355—75 **5 Claims**



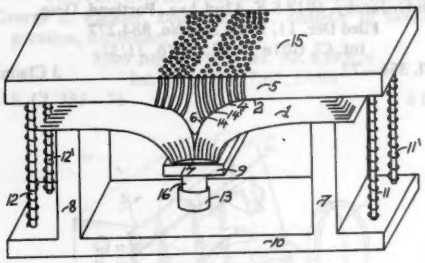
Document registration apparatus adapted to be positioned on the platen of a copying machine to present document information of different sizes along the optical centerline of an optical system providing enlarged or reduced size copy. The apparatus includes a base member located adjacent to the platen area to which a pair of document guide members are

pivotally connected. The guide members are formed with guide surfaces to present precise registration for document material inserted on the platen. A planetary gear train is used to drivingly position the guide members at different positions to effect a desired movement for the guide members relative to the platen area for registration of the different size document material along the optical centerline.

ERRATUM

For Class 355—76 see:
Patent No. 3,630,747

3,630,612
OPTICAL AID FOR BOOK REPRODUCTION
Kurt Lehovec, 11 Woodlawn Drive, Williamstown, Mass.
Filed Sept. 23, 1970, Ser. No. 74,704
Int. Cl. G03b *27/04*
U.S. Cl. 355—82 **10 Claims**

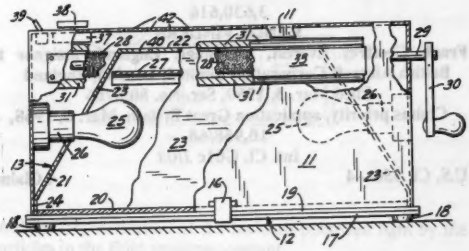


A curved open book page is fitted with a shaped solid body containing fiber optics to transfer optical information from book page onto a surface better suited for undistorted reproduction.

3,630,613
APPARATUS FOR FORMING DISCRETE AREAS OF COATING MATERIAL ON A SUBSTRATE
Edgar O. Sprude, Philadelphia, Pa., assignor to Burroughs Corporation, Detroit, Mich.
Filed Sept. 30, 1968, Ser. No. 763,769
Int. Cl. G03b *27/04*
U.S. Cl. 355—85 **5 Claims**

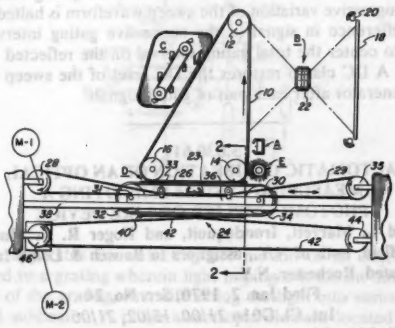
A substrate having a conductive layer attached to one surface, with the exposed portions of the conductive layer coated with a photoresist material, is incrementally moved past a linear array of lamps disposed laterally to the path of the substrate for selectively illuminating adjacent areas across the conductive layer to burn in the illuminated photoresist material. The energization of the lamps is controlled by a similar array of sensors and a light source disposed laterally to the path of a transparency which is moving at the same incremental speed as the substrate. This transparency has a grid or grating of squares drawn thereon having the same outline as the conductive layer and the same number of rows of squares in the grid as there are lamps or sensors. The grid squares corresponding to areas of the conductive layer to be retained are made opaque to a suitable degree and the sensing of an opaque square by a sensor energizes the corresponding lamp to burn in the desired portion of the photoresist material.

3,630,614
COPYING MACHINE FOR DOCUMENTS USING A HEAT-AND-LIGHT PROCESS
John V. Kazle, and Marvin A. Stoll, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of application Ser. No. 729,218, May 15, 1968, now abandoned. This application Jan. 16, 1970, Ser. No. 3,545
Int. Cl. G03b *21/14*
U.S. Cl. 355—100 **3 Claims**



Apparatus for making copies of documents by the light-and-heat process including an exposure station and a heat development station in integral relation. The exposure station consists of a light box with reflective walls that slope inwardly from a transparent pressure plate or exposure station to a perforate top. Housed within the sloping walls are an arcuate reflector and light sources for exposure of a document and a light-sensitive intermediate. The heat development station consists of an open-faced shoe, a rotatable roller having a compressible surface and a stripper for separating the intermediate and the developed copy sheet and for imparting to the copy sheet a reverse curl.

3,630,615
METHOD AND APPARATUS FOR TRANSPORTING SUPPORT MATERIAL
John M. Reynard, Framingham, Mass., assignor to Xerox Corporation, Rochester, N.Y.
Filed July 24, 1969, Ser. No. 844,530
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **9 Claims**



Method and apparatus for transporting materials into contact with a member with which the material interacts. A

cable drive moves a belt on a carriage holding the materials so that the materials have no relative motion with the work member they contact while in contact. The cable drive operates to rapidly index the belt to ready new material for contact with the work member and to more easily remove contacted material. An embodiment is used for transferring photoelectrophoretic images to support material by a transport capable of presenting the support material in rolling contact with the image to be transferred with suitable field conditions.

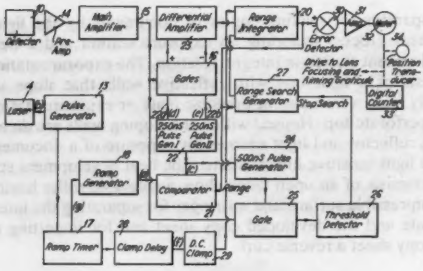
ERRATUM

For Class 356—256 see:
Patent No. 3,630,601

3,630,616
RANGE FINDERS

Frank Geoffrey Everest, Stevenage, England, assignor to British Aircraft Corporation Limited, London, England

Filed Mar. 3, 1969, Ser. No. 803,706
Claims priority, application Great Britain, Mar. 6, 1968, 10,958/68
Int. Cl. G01c 3/08
U.S. Cl. 356—4 4 Claims



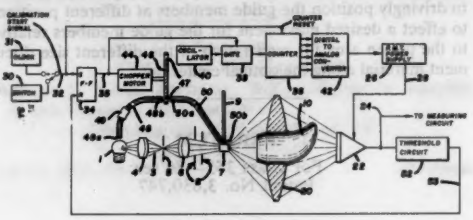
In a laser range finder a short ramp voltage is generated after each laser pulse and a long sweep voltage has a progressive voltage variation extending over a number of cycles of the short ramp voltage. Each time that a short ramp voltage waveform crosses the instantaneous value of the long sweep voltage, two successive gating signals are generated. If a reflected laser pulse arrives within the total gating interval, the progressive variation of the sweep waveform is halted and the difference in signal in the successive gating interval is used to center the total gating interval on the reflected laser pulse. A DC clamp restores the DC level of the sweep voltage generator after each pair of gating signals.

3,630,617
AUTOMATIC CALIBRATION OF AN OPTICAL MEASURING SYSTEM EMPLOYING A PHOTOMULTIPLIER OR LIKE DEVICE

Harold L. Marrett, Irondequoit, and Roger R. A. Morton, Penfield, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 2, 1970, Ser. No. 24
Int. Cl. G01n 21/00, 15/02, 21/06
U.S. Cl. 356—72 7 Claims

Automatic calibration of an optical-measuring system employing a photomultiplier tube or like device is achieved by varying the gain of the system until its response to a known event exceeds a predetermined threshold level. At that point,

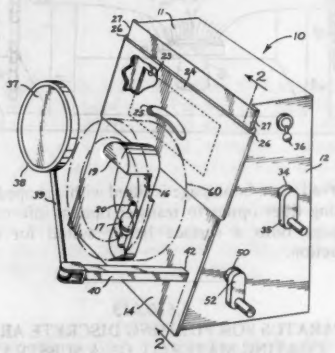


the gain which coincides with the threshold crossover point is held, thereby calibrating the system for future measurement.

3,630,618
BEARING INSPECTION INSTRUMENT

Carroll G. Jacoby, 6018 S.E. 42nd Ave., Portland, Oreg.

Filed Dec. 11, 1969, Ser. No. 884,277
Int. Cl. G01n 21/00, 21/16, 21/32
U.S. Cl. 356—72 3 Claims



A viewing instrument for inspecting ring or bearing surfaces. A shield plate having a light aperture therein separates a ring or bearing mount on the front of the instrument housing from a light source contained within the housing. A viewing lens is provided on the housing adapted to be positioned over the bearing mount. The light source, apertured shield and viewing lens are all individually movable with respect to the bearing mount so that the surface of a ring or bearing raceway may be illuminated and viewed under ideal conditions to identify blemishes thereon.

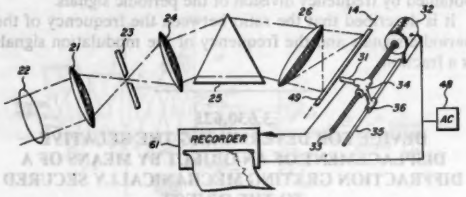
3,630,619
SPECTROPHOTOMETRY FOR REMOTE OBJECT IDENTIFICATION USING A LIGHT COMPENSATING FILTER

Fred D. Rosen, La Habra, and Walter W. Wrinkle, Seal Beach, both of Calif., assignors to North American Rockwell Corporation

Filed Mar. 13, 1970, Ser. No. 19,195
Int. Cl. G01j 3/00, 3/40
U.S. Cl. 356—74 1 Claim

An apparatus and means are disclosed for producing a compensating filter to be used in a spectrophotometer to compensate for variations in intensity of the various wavelengths in a particular light source and to compensate for the spectral response of the optical components in the

spectrophotometer so that when the filter is used therein the filtered spectrum of the light source produces a photodetector output that is substantially constant with wavelength. A method utilizing the filter is disclosed to record the spectrophotometry of the light rays from an object.

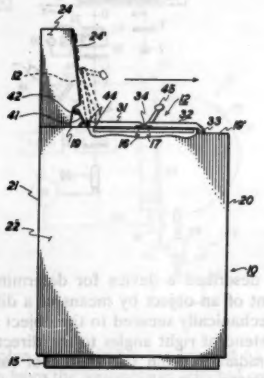


3,630,620

PLATEN COVER FOR COPYING MACHINES

George E. Fackler, Louisville, Ky., assignor to Xerox Corporation, Rochester, N.Y.

Filed July 2, 1969, Ser. No. 838,626
Int. Cl. G03b 27/62, 27/64
U.S. Cl. 355—76 4 Claims



A foldable cover for the platen of a copying machine which when closed shields the user against glare and holds the document being copied still without adverse image pickup. The cover consists of a pair of opaque, substantially equal sized members hinged together edge to edge in an assembly, the cover members being foldable one upon the other during storage. The cover assembly itself is hingedly supported adjacent the platen for combined swinging and lifting movement over and off from the platen and any document resting thereon.

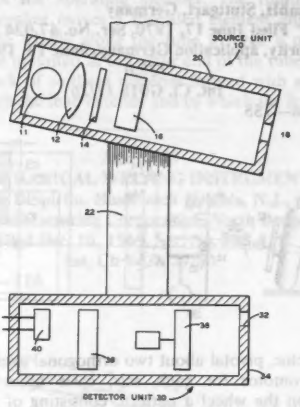
3,630,621

MEASUREMENT OF VISIBILITY THROUGH A FLUID USING POLARIZED LIGHT

John W. Liskowitz, Belle Meade, N.J., assignor to American Standard Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 629,568, Apr. 10, 1967, now abandoned. This application Nov. 12, 1968, Ser. No. 774,893
Int. Cl. G01n 21/00, 21/40
U.S. Cl. 356—104 3 Claims

The visibility through a turbid fluid media is determined by measuring the depth of penetration of a beam of polarized light into the fluid media. The depth of penetration is determined by varying the focal distance or optical path length until the depolarization of the incident polarized light by the particles in the fluid remains constant.

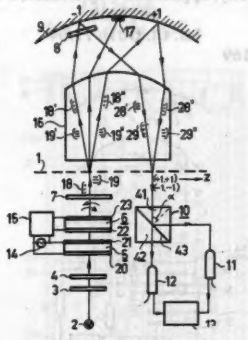


3,630,622

APPARATUS FOR DETERMINING THE RELATIVE MOVEMENT OF AN OBJECT BY MEANS OF A GRATING MECHANICALLY CONNECTED TO THE OBJECT

Hendrik de Lang, Delft, and Gijsbertus Bouwhuis, Emmasingel, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 6, 1969, Ser. No. 847,903
Claims priority, application Netherlands, Aug. 8, 1968, 6811252
Int. Cl. G01n 21/40; G01b 11/26
U.S. Cl. 356—114 23 Claims



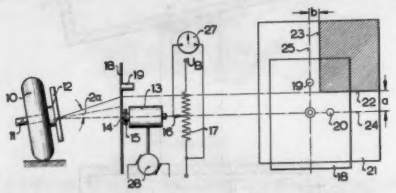
An apparatus for detecting the motion of an object attached to a grating wherein light impinges twice on different areas of the grating, first diffracting the light into various ordered subbeams. A phase-anisotropic element located in at least one subbeam and an electro-optic or magneto-optic modulator placed in the path of the composite beam produce orthogonally related beams, which after separation produce signals having a mutual phase difference varying about 180°.

3,630,623

DEVICE FOR MEASURING THE ANGULAR DEVIATION OF VEHICLE WHEELS

Gunter Schirmer, Leinfelden, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed June 17, 1970, Ser. No. 47,034
Claims priority, application Germany, June 18, 1969, P 19 30 737.0
Int. Cl. G01b *11/26*
U.S. Cl. 356—155 **17 Claims**



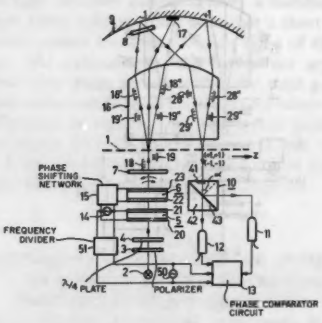
A projector, pivotal about two orthogonal axes and driven by a servomotor for each axis, casts upon a reflector mounted on the wheel a pattern, consisting of three bright quadrants and one dark quadrant, which reflector returns the image to a screen having therein two photodiodes of which the outputs control respective ones of the servomotors. The projector is pivoted about one axis until one boundary line of the dark quadrant bisects one of the photodiodes, and then about the other axis until the other boundary line of the dark quadrant bisects the other photodiode, whereupon in each case the corresponding servomotor is stopped and the value of camber, caster, or camber and pivot inclination is given directly by an electrical circuit having a variable resistor of which the value is changed by the pivoting of the projector. There is one projector on each side of the vehicle.

3,630,624

ARRANGEMENT FOR DETERMINING THE RELATIVE DISPLACEMENT OF AN OBJECT BY MEANS OF AN ELEMENT RIGIDLY SECURED TO THE OBJECT

Hendrik DeLang, Delft, and Gijsbertus Bouwhuis, Emmasingel, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,530
Claims priority, application Netherlands, Dec. 5, 1968, 6817430
Int. Cl. G01b *11/04*
U.S. Cl. 356—169 **2 Claims**



An arrangement for determining the relative displacement of an object by means of an element which is rigidly secured to the object and influences a beam of radiation emerging from a source of radiation is discussed, which arrangement further comprises a radiation modulator and an optical system which are inserted in the path of the radiation, the radiation ultimately impinging upon a photoelectric detector in which a signal is produced when the object is displaced.

It is set forth that for this purpose periodic signals from a signal generator are applied to the electric circuit which processes the electric signals produced in the detector, the modulation signals applied to the radiation modulator being obtained by frequency division of the periodic signals.

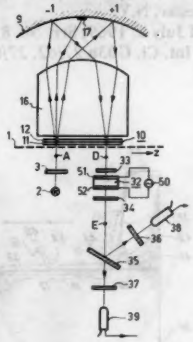
It is described that the ratio between the frequency of the periodic signals and the frequency of the modulation signals is a fraction.

3,630,625

DEVICE FOR DETERMINING THE RELATIVE DISPLACEMENT OF AN OBJECT BY MEANS OF A DIFFRACTION GRATING MECHANICALLY SECURED TO THE OBJECT

Hendrik De Lang, Delft, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1970, Ser. No. 1,117
Claims priority, application Netherlands, Jan. 11, 1969, 6900491
Int. Cl. G01b *11/26*
U.S. Cl. 356—170 **2 Claims**



There is described a device for determining the relative displacement of an object by means of a diffraction grating which is mechanically secured to the object and the grooves of which extend at right angles to the direction of displacement, the radiation from the source of radiation once or several times traversing the grating and an associated optical system which includes an optically anisotropic element and ultimately falling on at least one photoelectric detector, in which signals are generated in the case of a displacement. It is stated that for this purpose the optically anisotropic element is included in the image-forming ray path of the diffraction grating and comprises the series arrangement of two birefringent uniaxial plate-shaped crystals the principal sections of which taken at right angles to the crystal surfaces are normal to one another, while in these principal sections the angle between the optic axis and the crystal surface is the same in both crystals. It is stated that the angle lies between 30° and 45°.

3,630,626

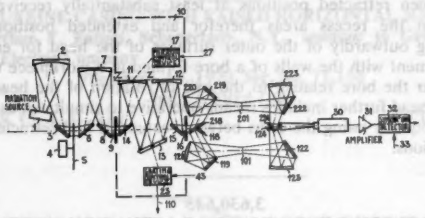
TWO-CHANNEL INFRARED SPECTROMETER WITH PIVOTING COLLIMATOR

Jean-Michel Rouberol, Courbevoie, France, assignor to Compagnie d'Applications Mecaniques a L'Electronique, Au Cinema et a L'Atomistique (c.A.M.E.C.A.)

Filed July 9, 1970, Ser. No. 53,517
Claims priority, application France, July 21, 1969, 6924740
Int. Cl. G01j *3/42*; G01n *21/34*
U.S. Cl. 356—95 **4 Claims**

In an infrared spectrometer with two channels preceded by a device for producing monochromatic radiation and constituted by a collimator, a diffraction grating and a focusing

element, the collimator can adopt two angular rest positions by pivoting about an axis perpendicular to the lines of the grating; in these two positions of the collimator, the focusing



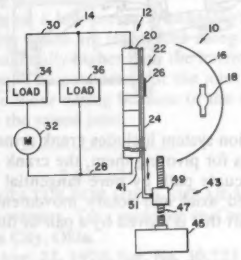
element directs a monochromatic beam whose wavelength depends solely upon the position of the grating, either onto a first slot or onto a second slot, those slots being respectively coupled to the two channels.

3,630,627

SOLAR CELL ASSEMBLY TEST METHOD

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Charles W. Cable, Bellevue, Wash.

Filed Feb. 27, 1970, Ser. No. 15,025
Int. Cl. G01j *1/42*; H01j *39/12*
U.S. Cl. 356—222 **8 Claims**



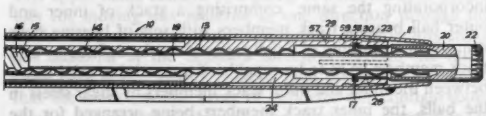
Defects in a solar cell assembly are located by measuring power generation from the assembly as selected cells are subjected to differential illumination either by shadowing the cell or by applying local higher intensity illumination to the cell.

3,630,628

PROPELLING PENCILS

John Roman, London, England, assignor to Mermaid Engineering Company Limited, London, England, a part interest

Filed Nov. 4, 1969, Ser. No. 873,983
Claims priority, application Great Britain, Nov. 4, 1968, 52,145/68
Int. Cl. B43k *21/08*
U.S. Cl. 401—68 **11 Claims**



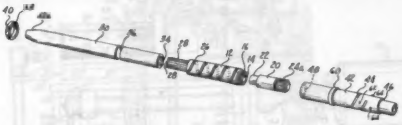
A propelling pencil having a tube with an internal double start screw thread, one end of the tube being surrounded by a resiliently flexible sleeve which engages with a portion of an operating member to restrain it against axial movement along the tube while permitting its rotation. An outer casing covers the tube and constricts the sleeve to further restrict the movement of the operating member. The rotation of the operating member moves a threaded element engaging the threaded tube axially along the tube to urge a pencil lead along a guide mounted at the other end of the tube which includes a block of resilient material formed with a puncture through which the lead extends and by which the lead is held.

3,630,629

MECHANICAL WRITING INSTRUMENT

Gino Carmen DiSpirito, Hasbrouch Heights, N.J., assignor to Kreisler Manufacturing Corporation, North Bergen, N.J.

Filed Dec. 16, 1969, Ser. No. 885,421
Int. Cl. B43k *24/06*
U.S. Cl. 401—116 **18 Claims**



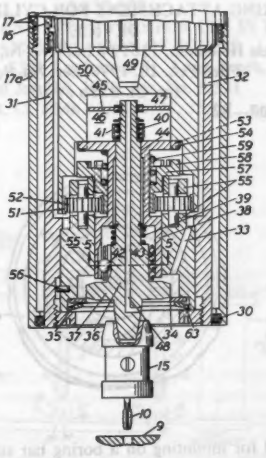
A mechanical writing instrument in which a carrier supporting an ink cartridge or the like is received by and threadably engages a driver tube rotatably positioned on a sleeve by a snapring. Interengageable means provide a connection between the carrier and the sleeve which permits relative axial movement therebetween while preventing rotary movement in response to rotation of the driver tube relative to the sleeve alternately to extend and retract the cartridge with reference to the sleeve. The assembly may be completed by a decorative two-part casing and a nose through which the point of the writing instrument may protrude.

3,630,630

POWER-OPERATED THREAD-CUTTING UNITS

Bengt Ebbe Harald Nyman, Rockford, Ill., assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sept. 3, 1969, Ser. No. 854,939
Claims priority, application Sweden, Sept. 10, 1968, 12126/68
Int. Cl. B23g *1/00*
U.S. Cl. 408—9 **7 Claims**



To provide a simple, compact thread-cutting unit, pressure fluid power means effect axial movement of a thread-cutting

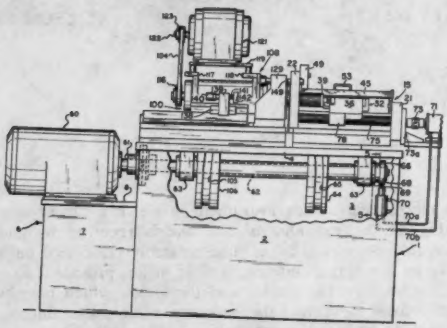
tap. The tap is driven by a fluid motor, the rotary speed of which is automatically adapted to the axial feed by controlling the back pressure on the motor, that is, by more or less throttling the exhaust from the motor under control of axial movement of the spindle carrying the tap, independent of the axial feed.

3,630,631

PISTON RING MACHINE FEED COMPENSATOR

Julius J. Becker, Saginaw, Mich., assignor to B & K Tool & Die Corporation, Saginaw, Mich.

Filed Apr. 10, 1969, Ser. No. 815,168
Int. Cl. B23b *19/00*
U.S. Cl. 408—19 **19 Claims**



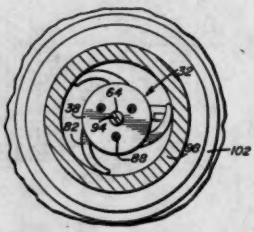
Apparatus for machining stacked workpieces wherein a stack is presented to a work station where individual workpieces are machined. The workpieces are yieldably mounted on a carriage which sequentially moves toward and away from the work station. Yieldable means operates to eject one of the workpieces on the end of the stack when the carriage is moved away from the work station. Fluid motor indexing means may be provided to control the yieldable means. Spherical bearing means may be utilized for transmitting force between the yieldable means and the stack of workpieces. A gauge may suitably be provided to regulate the movement of the members which clamp the stack at the work station.

3,630,632

CENTERING ATTACHMENT FOR CYLINDER-BORING DEVICE

Nathan Dale Holleman, 12619 82nd Ave. N., Seminole, Fla.

Filed Feb. 10, 1970, Ser. No. 9,471
Int. Cl. B23b *29/03*
U.S. Cl. 408—82 **10 Claims**



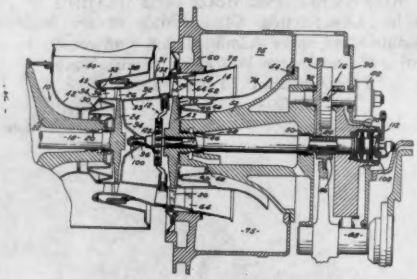
A head for mounting on a boring bar supported for rotation about a reference axis and shiftable along that axis. The head includes mounting structure for mounting a cutting tool thereon and is provided with a plurality of arcuate centering arms seated in recess areas therefor extending and spaced about the periphery of the head. One set of corresponding ends of the arms are pivotally supported in the corresponding recess areas for swinging of the other set of ends of the arms between retracted positions at least substantially received within the recess areas therefor and extended positions swung outwardly of the outer surfaces of the head for engagement with the walls of a bore formed in a workpiece to center the bore relative to the axis of rotation of the head. The head further includes means operative to simultaneously and equally swing the arms between extended and retracted positions.

3,630,633

GAS TURBINE ENGINE NOZZLE ACTUATION SYSTEM

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 7, 1970, Ser. No. 35,372
Int. Cl. F04d *27/00, 27/02*
U.S. Cl. 415—150 **5 Claims**



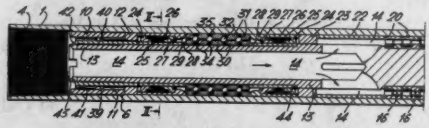
An actuation system includes crank arms connected to the nozzle blades for pivoting them, the crank arms being movable in an arcuate path by pure tangential forces applied by the combined axial and rotary movement of an internally mounted shaft that is moved by a pair of fluid-interconnected servos.

3,630,634

ROCK-DRILLING APPARATUS

William Mayall, 6 Arundel Gardens, Ash Lane, Rustington, Sussex, England

Filed June 26, 1970, Ser. No. 50,165
Claims priority, application Great Britain, July 1, 1969, 33,142/69
Int. Cl. F01d *11/08, 1/02*
U.S. Cl. 415—170 **7 Claims**



A thrust-bearing structure for a turbodrill, and a turbodrill incorporating the same, comprising a stack of inner and outer ball bearing track members with sets of bearing balls running in a plurality of axially spaced tracks defined by said track members so as to be capable of transmitting axial thrust between the inner and outer track members by shear stress in the balls, the inner track members being arranged for the transmission of axial thrust between neighboring ones of such inner track members and the outer track members being ar-

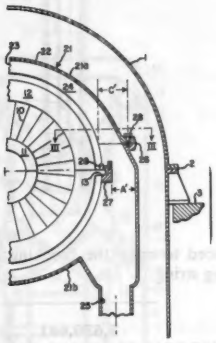
ranged for the transmission of axial thrust between neighboring ones of such outer track members, whereby axial loads are distributed through the bearing structure in use.

3,630,635

TURBINE CASING WITH RAISED HORIZONTAL JOINT

Arthur F. Fatum, Schenectady, N.Y., assignor to General Electric Company

Filed Sept. 10, 1970, Ser. No. 71,158
Int. Cl. F01d 1/00
U.S. Cl. 415—219 4 Claims



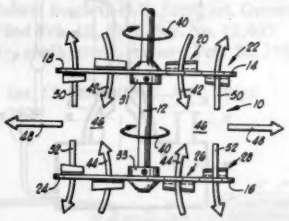
The inner casing of a low-pressure steam turbine has top and bottom sections which are connected along a horizontal joint disposed substantially higher than the horizontal centerline of the machine. The connectors at the joint can thus be located outside the inner casing because of the smaller sealing surface area at the raised joint.

3,630,636

BLADE APPARATUS FOR HIGH-SHEAR MIXING

Robert M. Hill, Rockport, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Filed Apr. 22, 1970, Ser. No. 30,725
Int. Cl. B01f 7/24
U.S. Cl. 416—199 6 Claims



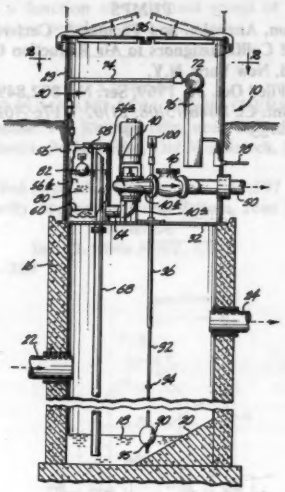
Apparatus for mixing materials at increased shear rate and efficiency which utilizes upper and lower spaced rotary mixer blades each driven in the same direction by a rotary shaft. The upper blade consists of a group of inner material deflectors for moving mix material in one direction through the blade while an outer concentric group of deflectors move mix material in the opposite direction through the mixer blade. The lower mixing blade is then oppositely formed so that the inner circular array of deflector-slot configurations moves mix material through the blade in opposition to material from the upper plate inner deflectors while an outer concentric ring of deflectors move mix material downward through the blade away from the upper blade outer deflectors.

3,630,637

SEWAGE-PUMPING STATION

Fred J. Repp, Portland, Oreg., assignor to Cornell Manufacturing Company, Portland, Oreg.

Filed Jan. 22, 1970, Ser. No. 5,052
Int. Cl. F04b 41/06; F04d 9/00
U.S. Cl. 417—7 3 Claims



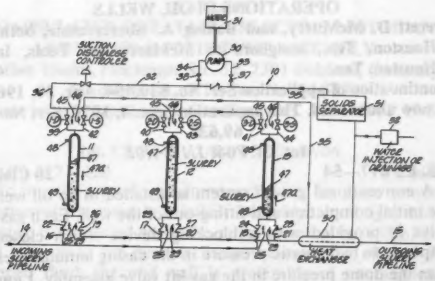
A sewage-pumping station including a sump and above the sump a machinery compartment. A pair of sewage pumps and a priming chamber for holding sewage are provided in the machinery compartment. A feed conduit extending from adjacent the base of the sump into the priming chamber provides for the flow of sewage into the priming chamber. A vacuum pump also mounted in the machinery compartment when actuated produces a subatmospheric pressure in the priming chamber effective to draw sewage from the sump into the priming chamber. The pair of sewage pumps have their inlet sides connected to the priming chamber and sewage in the priming chamber is used to prime these pumps.

3,630,638

METHOD AND APPARATUS FOR USE IN THE TRANSPORTATION OF SOLIDS

Maurice A. Huso, 5310 Las Lomas St., Long Beach, Calif.

Filed Jan. 26, 1970, Ser. No. 5,521
Int. Cl. F04b 17/00, 9/08, 35/00
U.S. Cl. 417—53 30 Claims



A method and apparatus to increase the pressure of a mixture of liquid and solids in a pipeline for transportation of the

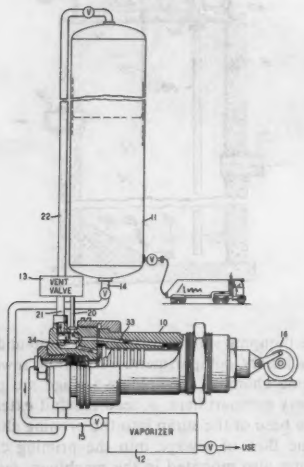
mixture through the pipeline at a constant velocity. The mixture is pressurized in a series of chambers into which alternately flows low-pressure liquid and out of which alternately flows high-pressure liquid. The low-pressure liquid is continuously diverted from the pipeline into the chambers while an equal amount of the high-pressure liquid is diverted from the chambers back into the pipeline.

3,630,639

SUCTION LINE VENT VALVE FOR RECIPROCATING PUMPS

Paul P. Duron, Anaheim, and Thomas A. Carter, Jr., Whittier, both of Calif., assignors to Air Reduction Company Incorporated, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,849
Int. Cl. F04b *15/08, 21/02;* **F17c** *7/02*
U.S. Cl. 417—53 **14 Claims**



This invention relates to an automatically controlled vent valve in a vent line connected to the suction line in a cryogenic pumping system. The vent valve is in an open position during the cooldown cycle and is moved to a closed position after the system has reached desired operating conditions. Blowby gas which leaks around the piston of the pumping system provides the pressure for closing the vent valve. The vent valve contains an orifice through which the blowby gas bleeds and returns to the storage vessel for the cryogenic fluid being pumped.

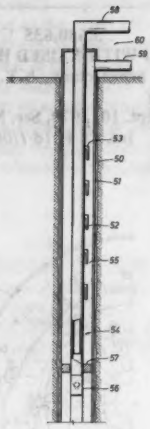
3,630,640

METHOD AND APPARATUS FOR GAS-LIFT OPERATIONS IN OIL WELLS

Everett D. McMurry, and Bolling A. Abercrombie, both of Houston, Tex., assignors to McMurry Oil Tools, Inc., Houston, Tex.

Continuation of application Ser. No. 820,454, Apr. 30, 1969, now abandoned. This application Sept. 4, 1970, Ser. No. 69,635
Int. Cl. F04f *1/18, 1/08*
U.S. Cl. 417—54 **28 Claims**

A conventional gas-lift system is installed in an oil well at the initial completion and fitting-out of the well. Each gas-lift valve is provided with a blocking device which closes in response to hydrostatic pressure in the casing annulus greater than the dome pressure in the gas-lift valve assembly. Liquids in the casing annulus may be displaced through a sleeve valve in the tubing by gas injection pressure greater than the hydrostatic pressure, after which the gas injection pressure



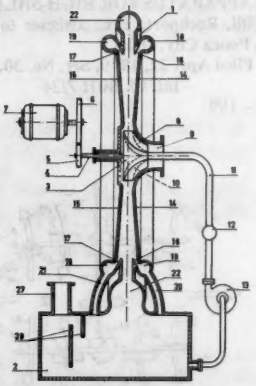
may be reduced to open the blocking devices for gas flow into the tubing string.

3,630,641

CENTRIFUGAL FLUID VANES COMPRESSOR

Pieter Van Staveren, Pijnacker, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast-Natuurwefen-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed Mar. 16, 1970, Ser. No. 19,758
Claims priority, application Netherlands, Mar. 20, 1969, 6904345
Int. Cl. F04c *19/00;* **B01d** *47/10*
U.S. Cl. 417—67 **3 Claims**

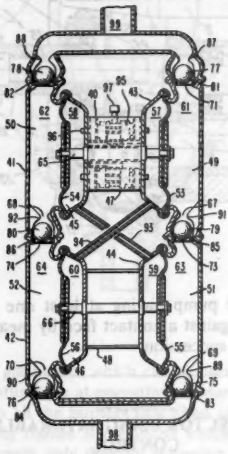


A centrifugal fluid vanes compressor for making an effluvium move in the direction of rotation of the fluid vanes and for compressing it, comprising a compression chamber bounded by two parallel walls between which the fluid vanes formed by a flowing fluid which emerges at a high velocity through openings in a rapidly rotating driven rotor, are rotating. The compressed effluvium is discharged and the fluid of the fluid vanes is collected in a fluid reservoir from where it is recycled via a pump.

The improvement consists in that the distance between the two parallel walls gradually increases from the center in radi-

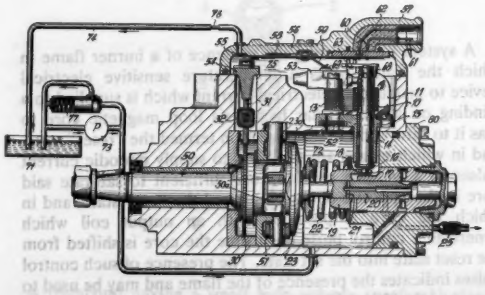
al direction in accordance with the increase of the thin layer of fluid that remains behind on the walls from where it may be discharged to the fluid reservoir via at least one interrupted or noninterrupted annular slotlike opening provided concentrically with the rotor.

3,630,642
DIAPHRAGM PUMP
Edmund J. Osterman, Winchester, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 3, 1970, Ser. No. 8,297
Int. Cl. F04b *3/00, 43/06;* **F01l** *15/18*
U.S. Cl. 417—245 **5 Claims**



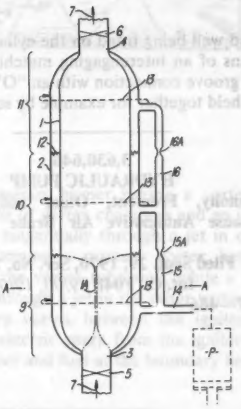
A diaphragm pump having means adapted to utilize the driving fluid of the pump to apply a supplementary force to the pumping diaphragm of the pump thereby providing a total pump discharge pressure which is greater than the pressure of the driving fluid.

3,630,643
FUEL INJECTION PUMP
Franz Eheim, Stuttgart; Konrad Eckert, Stuttgart-bad, Cannstatt, and Gerald Hofer, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Feb. 18, 1970, Ser. No. 12,409
Claims priority, application Germany, Feb. 28, 1969, P 19 10 112.3
Int. Cl. F04b *49/00, 7/04, 39/10*
U.S. Cl. 417—282 **15 Claims**



A fuel injection pump wherein the fuel distributing piston moves angularly and axially in synchronism with rotational speed of the engine and cooperates with an adjusting member which determines the beginning or termination of fuel injection into the cylinders. The adjusting member forms part of a transducer which is installed directly in the housing of the fuel injection pump and further includes an electromagnet having a rotary armature which is operatively connected with the adjusting member to position the latter in dependency on the intensity of signals which energize the electromagnet and are furnished by an electronic control circuit. The intensity of such signals, and hence the position of the armature, is a function of rotational speed of the engine, position of the gas pedal, and other factors.

3,630,644
FLUID PUMP AND ACTUATION THEREOF
Brian J. Bellhouse, The Ridings, Islip, near Oxford, and Francis H. Bellhouse, 34 Hill Rise, Old Woodstock, both of England
Filed June 23, 1969, Ser. No. 835,597
Claims priority, application Great Britain, June 28, 1968, 30,889/68
Int. Cl. F04b *35/02, 43/10*
U.S. Cl. 417—389 **16 Claims**

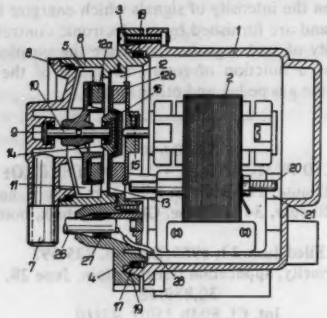


The invention disclosed resides in a pump operating on what are generally thought of as "peristaltic" lines, and in which a flexible-walled duct is the pumping chamber and is surrounded by a cell structure into and out of which a flow of an actuating pressure-fluid is pulsatingly caused by some external means. The duct may have check valves in its entry and exit, or it may be self-valving by closing up completely when contracted, such closing being progressive from the upstream to the downstream end.

3,630,645
ENCAPSULATED ROTATABLE ELECTRIC MOTOR AND ROTATABLE FLUID PUMP ASSEMBLY
Gunther Eheim, Plochinger Str. 32, 7301 Deizisau, Germany
Filed Feb. 26, 1970, Ser. No. 14,529
Claims priority, application Germany, Oct. 17, 1969, P 19 52 352.5
Int. Cl. F04b *17/00, 35/00, 39/06*
U.S. Cl. 417—420 **6 Claims**

To provide a totally oil-immersed motor for drive communication with a pump in a unitary assembly, an oil tight motor housing is separated from the pump housing by a thin, end wall to provide for heat exchange between the oil and the pumped fluid; the end wall is preferably of nonmagnetic, high-electrical resistance material, to permit a magnetic coupling to be used from the motor shaft to the pump impeller, the high-electrical resistance minimizing eddy current

losses (such as some stainless steels). To facilitate assembly, the motor housing is preferably cylindrical for insertion of the motor therein as one unit, the pump housing with the



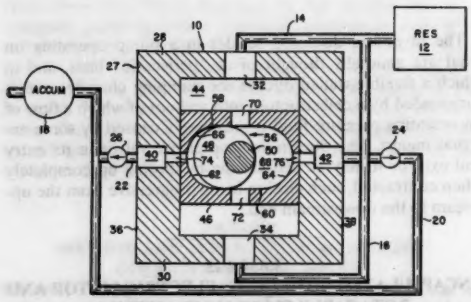
common end wall being fitted on the cylindrical motor housing by means of an interengaging matching circumferential tongue and groove connection with an "O" ring as a seal, the parts being held together for example by screws.

3,630,646

HYDRAULIC PUMP

Denis Connolly, Fremont, Ohio, assignor to Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

Filed Sept. 29, 1970, Ser. No. 76,490
Int. Cl. F04b *29/00, 19/02*
U.S. Cl. 417—466 **4 Claims**



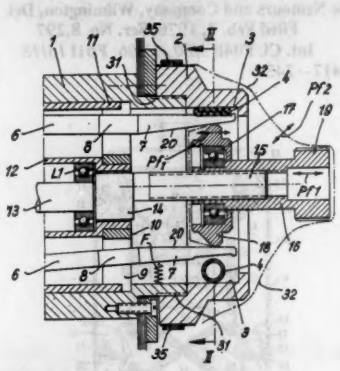
A hydraulic pump especially adapted for full power hydraulic braking systems wherein an eccentrically mounted rotor is adapted to reciprocate a shuttle block, the latter being provided with inlet and outlet openings and having a pumping chamber is which the rotor is mounted, rotational movement of the rotor effecting a pumping action of the fluid as well as controlling the inlet and outlet of fluid to and from the pumping chamber.

3,630,647

FLEXIBLE-HOSE PUMP

Hansjorg Kochlin, Schlosserstrasse 38, 783 Emmendingen, Germany

Filed Mar. 9, 1970, Ser. No. 17,370
Claims priority, application Germany, Mar. 8, 1969, P 19 11 874.2
Int. Cl. F04b *43/08, 43/12*
U.S. Cl. 417—474 **10 Claims**



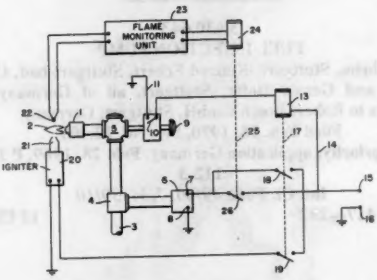
A flexible-hose pump having at least one flexible hose which is pressed against a contact face by means of pivoted fingers actuated in succession.

3,630,648

FLAME DETECTOR USING SATURABLE CORE CONTROL

William H. Hulsman, Needham, Mass., assignor to Columbia Gas System Service Corporation, Columbus, Ohio

Filed June 15, 1970, Ser. No. 46,155
Int. Cl. F23n *5/10*
U.S. Cl. 431—80 **9 Claims**



A system for detecting the presence of a burner flame in which the flame heats a temperature sensitive electrical device to produce an electrical current which is supplied to a winding on a rectangular hysteresis loop magnetic core to bias it to saturation in one direction termed the "reset" state, and in which means are provided to supply periodic current pulses to a winding on said core sufficient to saturate said core in the opposite direction termed the "set" state, and in which the core is provided with an output coil which generates a control pulse each time the core is shifted from the reset state into the set state. The presence of such control pulses indicates the presence of the flame and may be used to keep fuel flowing to the burner. A plurality of such cores are arranged to be individually controlled by a plurality of flames

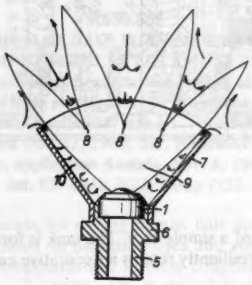
and means are provided to select the number and combination of the flames and cores to be controlled, including means for selectively connecting the outputs of the selected cores in parallel.

3,630,649

SHROUDED GAS BURNERS AND JETS THEREFOR

John Hancock, Leeds, and Albert Westerman, Normanton, both of England, assignors to Geo. Bray & Company Limited, Leeds, England

Filed Aug. 1, 1969, Ser. No. 846,832
Claims priority, application Great Britain, Aug. 20, 1968, 39,712/68
Int. Cl. F23d *15/02*
U.S. Cl. 431—353 15 Claims



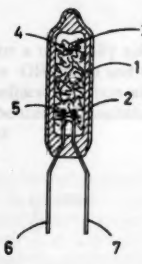
A shrouded gas burner which can be used for all gases and in particular natural gas at operating pressures of 6–10 inches water gauge. In all the burners described an array of closely spaced diverging flames is produced which coalesce over a part of their length only thereby achieving both mutual stabilization and satisfactory aeration of the flames as a whole. The use of a shroud around the coalesced region of the flames protects them from direct airflow and contains the products of combustion near to the reaction zone so that they may be reentrained thereby accelerating the combustion process.

3,630,650

FLASHLAMP AND APPARATUS FOR MAKING SAME

Peter Kaufmann, Stadtbergen, and Reinhold Liepert, Wortelstetten, both of Germany, assignors to Patent-Treuhand-Gesellschaft, fur elektrische Gluhlampen mbH, Munich, Germany

Filed Mar. 12, 1970, Ser. No. 18,875
Claims priority, application Germany, Mar. 17, 1969, P 19 13 417.9
Int. Cl. F21k *5/02*
U.S. Cl. 431—95 8 Claims



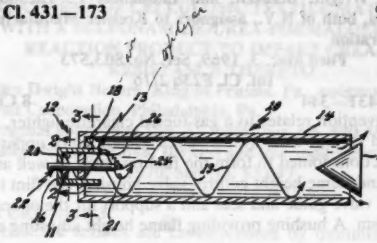
A flashlamp having a small bulb volume (preferably less than 1 cc.) contains a filling of metal foil shreds, preferably of zirconium, of small cross section of 2 to 10×10^{-4} mm.^{2}, which have from 8 to 50 sharp bends, forming acute angles, preferably from 12 to 30 bends per 100 mm. of shred length to effect point contact between the filling and bulb wall. The radius of curvature of the bends is preferably smaller than 0.3 mm. and the angle formed by an individual bend is preferably smaller than 60°. The cross section of the ball formed by a shred of 100 mm. in length is from 40 to 8 mm.^{2}, preferably from 30 to 12 mm.^{2}. A light gain exceeding 40 percent and a longer peak time is obtained.

3,630,651

DUAL VORTEX BURNER

Richard J. Fay, and James P. Kottenstette, both of Denver, Colo., assignors to The United States of America as represented by the Secretary of the United States Air Force

Filed May 14, 1970, Ser. No. 37,230
Int. Cl. F23c *5/18*
U.S. Cl. 431—173 9 Claims



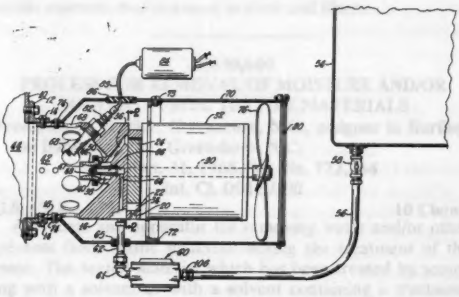
A dual vortex gaseous burner having a vortex tube, a separator tube, a pair of vortex chambers and an igniter. An oxidizer is injected tangentially through a jet in one of the vortex chambers forming a primary vortex between the separator tube and the vortex tube wall, while a fuel is injected tangentially through a jet in the other vortex chamber forming a secondary vortex between the igniter and the separator tube. An electric spark from the igniter produces ignition of the oxidizer and fuel at the boundary between the two vortices.

3,630,652

LIQUID FUEL BURNER SYSTEM AND FUEL CONTROL

Warren D. Nutten, Grafton, Wis., and Bernard C. Phillips, Toledo, Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 22, 1968, Ser. No. 754,684
Int. Cl. F23d *13/24*
U.S. Cl. 431—253 1 Claim



1. A low-pressure oil burning unit comprising a burner head, a low-pressure aspirating nozzle mounted in and pro-

jected from said head, said nozzle having fuel and aspirating passages, said head having means defining a fuel passage in connection with said nozzle fuel passage, a compressor in connection with said head for delivering a high-velocity flow of air to and through said nozzle aspirating passage, a supply line in connection with said fuel passage incorporating therein a control regulator including a housing having an intermediately positioned diaphragm forming two chambers, one of which is vented to the atmosphere and the other of which has an inlet and an outlet positioned in the line of flow through said regulator, and means normally sealing said inlet operative to block the flow of fuel through said other chamber and its outlet and prevent its passage to said nozzle except on the occurrence of a high-velocity flow of air through the aspirating passage of said nozzle.

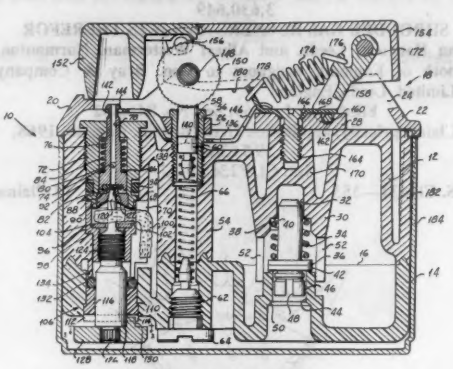
3,630,653

GAS-FUELED CIGARETTE LIGHTER

Ivan A. Wright, Blauvelt, and Emmanuel C. Theodosiou, Corona, both of N.Y., assignors to Kreisler Manufacturing Corporation

Filed Mar. 3, 1969, Ser. No. 803,573
Int. Cl. F23q 2/16
U.S. Cl. 431—344 **8 Claims**

The invention relates to a gas-fueled cigarette lighter, having a fuel tank of clear synthetic resin made up of upper and lower sections joined to form the fuel reservoir as well as the shutoff and flame height control valve housing, the flint tube, the refill valve guide and seat and a support for the operating mechanism. A bushing providing flame height adjusting stops is frictionally mounted in the bottom of the valve housing to permit the limits of the flame height adjustment to be changed in the course of manufacture or later during servicing by means of a simple tool. The tank is formed with a leaf spring which resiliently retains a decorative casing in position on the tank.



CHEMICAL

3,630,654
AQUEOUS ALCOHOLIC ACID DYE-CARBOXYLATED POLYMER COMPOSITIONS FOR DYEING AND GROOMING HAIR

Norman Allen Rosenthal, Sterling Forest, Tuxedo, N.Y., and Donald Joseph Delano, Whippany, N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 15, 1968, Ser. No. 729,373
Int. Cl. A61k *7/12*
U.S. Cl. 8—10.1 16 Claims

An oil-in-water emulsion capable of dyeing and grooming hair containing an acid dye, a slightly water-soluble alcohol and a water-soluble carboxy containing polymer.

3,630,655
DYEING HUMAN HAIR WITH OXIDATION DYES COMPRISING HETEROCYCLIC AMINO COMPOUNDS

Peter Berth, Dusseldorf-Benrath, and Rudolf Maul, Bensheim, both of Germany, assignors to Therachemie Chemisch Therapeutische Gesellschaft m.b.H.

Filed Oct. 22, 1968, Ser. No. 769,749
Claims priority, application Austria, Nov. 6, 1967, A 9977/67
Int. Cl. A61k *7/12*; D06p *1/32*
U.S. Cl. 8—11 5 Claims

The novel means for dyeing human hair according to the invention are based on oxidation dyes and comprise heterocyclic amino compounds and suitable coupling components. For example, 2 parts of 6-aminotetrahydroquinoline hydrochloride, 1 part of α-naphthol, 1 part of hydrogen peroxide are mixed with 96 parts of water and adjusted to a pH of 9.5. By treating gray human hair with the resulting solution a dark blue coloration is obtained.

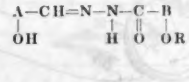
The hair dyes according to the invention have, in addition to other favorable characteristics, the advantage of being easily removable from the hair, e.g., by reducing agents.

3,630,656
PROCESS FOR THE DYEING AND PRINTING OF METAL-CONTAINING POLYOLEFIN TEXTILE MATERIALS

Gerhard Wolfrum, Opladen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 20, 1969, Ser. No. 867,916
Claims priority, application Germany, Oct. 19, 1968, P 18 04 133.3
Int. Cl. D06p *1/36*; C09b *65/00*
U.S. Cl. 8—31 2 Claims

Dyeing and printing of textile materials of metal-containing polypropylene with compounds of the general formula



in which A stands for a optionally substituted benzene or naphthalene radical the -OH-group and the substituent -CH N- being attached to adjacent carbon atoms; B represents a optionally substituted benzene or naphthalene the substituent -OR and the substituent

being attached to adjacent carbon atoms and R representing an alkyl radical A and B cannot simultaneously represent radicals of the benzene series.

3,630,657
POLYISOCYANATE TREATMENT OF POLYURETHANE FIBERS

Carl John Setzer, Durham, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 1, 1969, Ser. No. 812,412
Int. Cl. D06m *9/00*; D01d *5/12*
U.S. Cl. 8—115.5 6 Claims

Elongation is reduced and the tensile strength and elastic properties of preformed elastomeric, polyurethane fibers are improved by subjecting the fibers to a stretching operation which includes treatment in an organic diisocyanate containing solution to effect a chemical cross-linking modification during stretching.

3,630,658
TREATMENT OF CELLULOSIC TEXTILE MATERIALS WITH A SULFONAMIDE-UREA-FORMALDEHYDE REACTION PRODUCT TO IMPART CREASE RESISTANCE THERETO

Ashley Dwight Nevers, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Original application Oct. 31, 1966, Ser. No. 590,558, now Patent No. 3,536,648. Divided and this application July 9, 1970, Ser. No. 53,697
Int. Cl. D06m *13/14*, *13/40*
U.S. Cl. 8—116.3 4 Claims

Cellulosic textiles are creaseproofed by treatment with a composition comprising the product of the interaction of 1 mole methanesulfonamide, from about 0.2 mole to about 2 moles of urea or carbamylurea, and from about 3 to about 10 moles formaldehyde, said product having a free formaldehyde content of from about 10 percent to 50 percent.

3,630,659
PROCESS FOR PREVENTING DAMAGE TO NATURAL PROTEIN-CONTAINING FIBERS

Udo-Winfried Hendricks, Cologne Stammheim; Mathieu Quaedvlieg, Opladen, and Walter Schonberger, Leverkusen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 10, 1968, Ser. No. 696,700
Claims priority, application Germany, Jan. 14, 1967, F 51255
Int. Cl. D06m *13/40*
U.S. Cl. 8—133 2 Claims

Water soluble polyamides which are obtained by reacting aliphatic polyamines with α, β-unsaturated aliphatic monocarboxylic acids or aliphatic polycarboxylic acids optionally containing hetero atoms or their functional derivatives capable of forming amides are used as agents for preventing damage to protein-containing fiber materials or mixtures of such materials by adding the polyamides to an acidic aqueous medium used to treat said fibers.

3,630,660
PROCESS FOR REMOVAL OF MOISTURE AND/OR SOLVENTS FROM TEXTILE MATERIALS

Frederick C. Wedler, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 31, 1968, Ser. No. 772,264
Int. Cl. D01c *1/00*
U.S. Cl. 8—139 10 Claims

A process and apparatus for removing water and/or other solvents from textile materials during the treatment of the same. The textile material which has been treated by scouring with a solvent or with a solvent containing a treatment material, or a textile which has been treated by a solvent media for the application of chemicals, dyestuffs, or the like, is subjected to vacuum, and if desired, to a predetermined controlled temperature for a predetermined controlled time

period in order to remove residual solvent from the textile, and from any desired treating materials. In the situation where the treating material is a solvent media with chemicals or dyestuffs, the temperature may be elevated above that necessary to vaporize the residual solvent so that the chemicals or dyestuffs may react and be deposited on the textile material and be affixed thereto.

A solvent can be defined as "that which dissolves," i.e., a medium into which other materials can be put into solution or suspension to give fluency. Water is the most generally used solvent, and is treated here in the same context as the low-boiling hydrocarbon solvents, that is, a solvent to be recovered.

3,630,661

PROCESS FOR DEGREASING AND DESIZING FABRICS HAVING SYNTHETIC FIBERS

Georges Ramier, Villefranche sur Saone, and Remy Blanc, Lyon 1er, both of France, assignors to Societe Civile dite Soltex, Paris, France

Filed Dec. 18, 1969, Ser. No. 886,418
Claims priority, application France, Dec. 19, 1968, 50774
Int. Cl. D06l *1/02*
U.S. Cl. 8—139.1 **1 Claim**

Synthetic textiles are both degreased and desized by passing the textiles through a bath of an anhydrous solvent containing a dissolved alkaline agent. The textile is then preferably rinsed in a compatible solvent.

3,630,662

PROCESS OF DYEING SHAPED CONDENSATION POLYMER MATERIAL IN HEATED TWO-PHASE DYE LIQUID

Harry Brody, Chester, England, and Kenneth A. Reinhart, Summit, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Sept. 19, 1966, Ser. No. 580,191
Int. Cl. D06p *5/06, 5/04, 3/24*
U.S. Cl. 8—172 **17 Claims**

A method for dyeing difficulty meltable linear organic condensation polymers having nitrogen and oxygen atoms as a part of the polymer chain, particularly when such polymers are in fiber form. The method uses an aqueous dyebath, an organic solvent assist which is at most only slightly soluble in water, and a water-soluble dye which is at least partially soluble in said dye assist. A salting-out agent is utilized in the aqueous dyebath to force the dye into the organic dye assist portion, thereby facilitating a more rapid and complete exhaustion of the dyebath onto the polymer. Particularly desirable organic solvent assists are members of the group consisting of cresols and xylenols. The process is particularly useful in dyeing high-melting aromatic and cyclic aliphatic containing linear condensation polyamides, particularly those melting above 275° C., such as polyhexamethylene terephthalamide, which filaments are best formed by spinning from concentrated sulfuric acid solutions because of their high-melting points.

3,630,663

PROCESS FOR DYEING ANIONIC MODIFIED SYNTHETIC FIBERS IN DYE BATHS CONTAINING AN ORGANIC NITROGEN COMPOUND

Dietrich Hildebrand, Leverkusen; Gunter Briedbach, Cologne Flittard, and Helmut Kirschnek, Leverkusen-Schlebusch, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 12, 1969, Ser. No. 798,812
Claims priority, application Germany, Aug. 30, 1968, P 17 94 049.7 Dec. 18, 1968, P 18 15 417.1
Int. Cl. D06p *5/06*
U.S. Cl. 8—172 **9 Claims**

Synthetic fibers containing anionic groups, e.g. polyacrylonitrile modified with sulfonic acid groups, are dyed by exhaustion in a dyebath comprising:

A. hydrocarbon chloride solvent;

B. 0.1 to 4% of water based on the solvent;

C. a basic dyestuff soluble in hydrocarbon chloride solvent; and

D. an organic nitrogen compound containing at least 12 carbon atoms, e.g. a fatty amine such as dodecylamine.

3,630,664

PROCESS FOR DYEING SHAPED ARTICLES OF AROMATIC POLYCARBONATES

Joachim Nentwig; Karl Fuhr; Hans Rudolph, all of Krefeld-Bockum, and Johannes Romatowski, Dormagen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 7, 1967, Ser. No. 644,081
Int. Cl. D06p *3/52*
U.S. Cl. 8—173 **7 Claims**

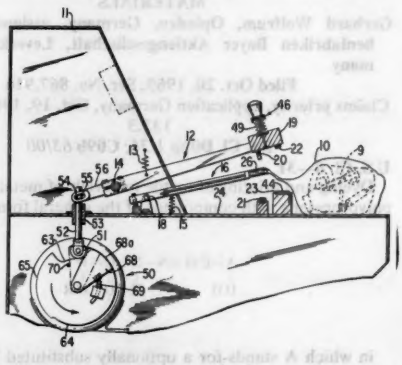
Obtaining deep shades and substantially accelerating dyestuff absorption in the dyeing of aromatic polycarbonates with dispersion dyestuffs or developing dyestuffs by carrying out the dyeing process in the presence of an aliphatic, aromatic or mixed aliphatic aromatic carbonate.

3,630,665

METHOD OF STERILIZATION

Harold Willids Andersen, Oyster Bay; Harold W. Andersen, Laurel-Hollow, and Charles H. Harrison, Oyster Bay Cove, all of N.Y., assignors to H. W. Andersen Products, Inc., Oyster Bay, N.Y.

Original application June 30, 1966, Ser. No. 561,777, now Patent No. 3,516,223, which is a continuation-in-part of application Ser. No. 448,090, Apr. 14, 1965, now Patent No. 3,476,506. Divided and this application Aug. 25, 1969, Ser. No. 858,248
Int. Cl. B65b *31/06, 55/18*
U.S. Cl. 21—58 **6 Claims**



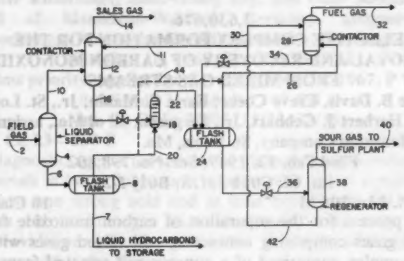
A method of sterilization consists of introducing the items to be sterilized and a sterilant into an enclosure made at least partially of a semipermeable membrane and thereafter sealing the enclosure. The sterilant in the enclosure is passed to the surrounding atmosphere through the semipermeable membrane at a rate which maintains a concentration of the sterilant in the enclosure long enough to sterilize the items and at a rate in which neither harmful nor dangerous levels of the sterilant are released in the surrounding atmosphere.

3,630,666

PRECONTACTING HYDROGEN SULFIDE CONTAINING GAS STREAMS WITH RICH SULFINOL

Lorenz V. Kunkel, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed July 30, 1969, Ser. No. 846,101
Int. Cl. B01d *53/34*
U.S. Cl. 23—2 R 10 Claims



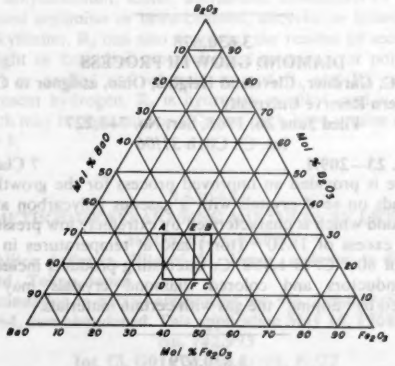
The efficiency of a gas-sweetening system is improved by first separating a high-pressure field sour gas into a gas and a liquid stream, sending the liquid stream to a flash tank to obtain separate liquid and sour gas fractions. The latter is then combined with rich absorbent solution from the high-pressure contactor acting on the first mentioned high-pressure gas stream. The higher hydrogen sulfide partial pressure in the aforesaid sour gas fraction causes physical solution of the H_2S resulting in lessening the load on the downstream low-pressure contactor. By operating in this fashion the sweetening agent circulation rate to the contactors is approximately 30 percent less than required by conventional methods.

3,630,667

PRODUCTION OF BARIUM FERRITE

Brian Thomas Shirk, St. Marys, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.

Filed Apr. 1, 1969, Ser. No. 812,158
Int. Cl. C01g *49/00*
U.S. Cl. 23—51 7 Claims



In accordance with this invention barium ferrite hard magnetic materials are produced by quenching a molten homogeneous composition of B_2O_3, BaO and Fe_2O_3 within the area ABCD of FIG. 1 to form a homogeneous, substantially noncrystalline glass, heating the quenched glass to nucleate and crystallize barium ferrite in a borate-rich matrix, and separating the matrix material from the crystallized barium ferrite.

3,630,668

MANUFACTURE OF SOLID MATERIALS IN A MOVING BED REACTOR

John Wright Coulter-Black, Ville Jacques Cartier, Quebec; John Douglas McIrvine, Mont-Saint-Hilaire, Quebec, and John Dudley Simpson, Beoceil, Quebec, all of Canada, assignors to Canadian Industries Limited, Montreal, Quebec, Canada

Filed June 9, 1969, Ser. No. 831,555
Claims priority, application Great Britain, June 21, 1968, 29,690/68
Int. Cl. C05c *1/00*
U.S. Cl. 23—103 9 Claims

A process for manufacturing solid materials employing a reactor containing a moving bed of the product particles having separate reaction and cooling zones. One of the reactants is gaseous. The process can be employed for the manufacture of ammonium metabisulphite, ammonium nitrate and ammonium phosphate.

3,630,669

PROCESS FOR REMOVING IMPURITIES IN THE LIQUID OF ZINC REFINING BY WET METHOD

Akira Naito, and Shigeo Oosawa, both of Tokyo, Japan, assignors to Mitsubishi Edogawa Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1968, Ser. No. 784,481
Claims priority, application Japan, Dec. 26, 1967, 42/82957
Int. Cl. C01g *9/06*
U.S. Cl. 23—125 5 Claims

Impurities in the liquid of zinc refining by wet method are removed by treating a solution containing zinc with metallic zinc and removing precipitate thereby formed, thereafter adding to the solution hydrogen peroxide in an amount sufficient to oxidize ferrous iron contained in the solution to ferric iron.

3,630,670

PSEUDOBOEHMITIC ALUMINA AND PROCESS FOR MAKING SAME

Norman Bell, Walnut Creek; John Wesley Price, Pleasanton, and Ronald James Rigge, Livermore, all of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed May 25, 1970, Ser. No. 39,958
Int. Cl. C01b *7/34*
U.S. Cl. 23—143 10 Claims

Alumina of substantially pseudoboehmitic structure is made by the reaction of an alkali aluminate solution with a mineral acid solution. The alumina produced is characterized by its low Na_2O content of less than about 0.03 percent by weight, a pore size distribution wherein pores of sizes within the range of 120–800 A constitute a significant percentage of the total porosity.

3,630,671

OXIDATION OF HYDROGEN CYANIDE TO CYANOGEN IN A LIQUID MEDIUM UTILIZING A GROUP VIII NOBLE METAL CATALYST IN COMPLEX ASSOCIATION WITH A BIPHYLLIC LIGAND

Michael J. Block, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 1, 1969, Ser. No. 846,937
Int. Cl. C01c *3/00*; B01j *11/00*
U.S. Cl. 23—151 11 Claims

Hydrogen cyanide is oxidized to cyanogen by contacting hydrogen cyanide and oxygen with a substantially anhydrous liquid medium containing a Group VIII noble metal, preferably in complex with a biphyllic ligand at a temperature between 20° and 300° C. and at a pressure sufficient to maintain liquid phase conditions. A preferred embodiment is contacting hydrogen cyanide and oxygen with a carboxylic acid containing a complex of rhodium chloride and triphen-

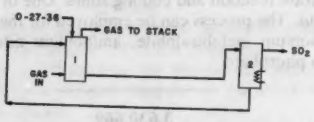
ylphosphine at a temperature between 20° and 150° C. The process is advantageous in that use of an inorganic nitrogen oxide promoter is not required.

3,630,672

USE OF POTASSIUM POLYPHOSPHATE IN SO_2 RECOVERY FROM STACK GASES

John M. Potts, Florence, Ala., assignor to Tennessee Valley Authority

Filed Mar. 14, 1969, Ser. No. 807,288
Int. Cl. C01b *17/56, 17/04*
U.S. Cl. 23—178 12 Claims



Recovery of sulfur dioxide from stack gas consisting of scrubbing the gas with potassium polyphosphate solution to form a slurry of crystallized potassium pyrosulfite. The potassium pyrosulfite is regenerated for further pickup of sulfur dioxide by (1) heating the slurry directly, (2) separating the potassium pyrosulfite and treating it in a reflux stripper, (3) heating the potassium pyrosulfite in solid form, or (4) heating solid potassium pyrosulfite to drive off one-third of the sulfur dioxide and reducing the remaining two-thirds to form hydrogen sulfide, the sulfur dioxide and hydrogen sulfide being reacted to form elemental sulfur.

3,630,673

SOURCE COMPOSITION FOR ALKALI METAL OXIDES AND ALKALINE EARTH METAL OXIDES

William A. Mod, Midland, Mich., and Donald L. Caldwell, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 26, 1968, Ser. No. 724,627
Int. Cl. C01d *1/00;* C01f *11/02*
U.S. Cl. 23—184 7 Claims

This specification discloses a source composition for alkali metal oxides and alkaline earth metal oxides useful, for example, in preparing a final glass product, the composition having a chemical formula of $Na_2Ca(OH)_4$.

3,630,674

BLEACHING OF ALKALI METAL HYDROXIDE SOLUTIONS

James G. Davidson, Jr., Whitehall, Mich., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed June 13, 1969, Ser. No. 833,145
Int. Cl. C01d *1/06, 1/00*
U.S. Cl. 23—184 7 Claims

Consistent color removal from aqueous alkali metal hydroxide solutions is obtained by prebleaching such solutions with a chlorine bleaching agent, and then afterbleaching the product with hydrogen peroxide.

3,630,675

SELECTIVE OXIDATION OF FERROUS SCRAP

Charles Prasky, Minneapolis, and Warren M. Mahan, Grand Rapids, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior

Filed Feb. 10, 1969, Ser. No. 798,150
Int. Cl. C01g *49/08;* B07b *13/00;* C21b *1/02*
U.S. Cl. 23—200 10 Claims

A method for utilizing ferrous scrap, particularly automobile scrap, comprising selectively oxidizing the scrap under conditions such that portions of the scrap having a thickness less than about one-eighth inch are substantially completely oxidized and portions having a thickness greater than about one-eighth inch are less than completely oxidized. The unoxidized portion of the scrap is then recovered as a dense residual scrap which may be used as a heavy melting stock for an electric furnace or foundry. The oxidized scrap, consisting of a high-grade iron oxide material, finds utility in processes such as production of powder iron by various sponge iron processes.

3,630,676

SELECTIVE COMPLEX FORMATION FOR THE REMOVAL AND RECOVERY OF CARBON MONOXIDE FROM MIXED GAS STREAMS

George B. Davis, Creve Coeur; Earle C. Makin, Jr., St. Louis, and Herbert J. Gebhart, Jr., Ferguson, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 12, 1969, Ser. No. 798,802
Int. Cl. C01b *31/18;* B01j *1/22*
U.S. Cl. 23—204 M 10 Claims

A process for the separation of carbon monoxide from mixed gases comprising contacting said mixed gases with a first complex comprised of a cuprous salt selected from the group consisting of cuprous fluoroborate and cuprous fluorophosphate together with a hydrocarbon selected from the group consisting of aromatic hydrocarbons, olefin hydrocarbons and mixtures thereof to produce a second complex containing the carbon monoxide and recovering carbon monoxide from the resulting second complex phase.

3,630,677

MANUFACTURE OF SYNTHETIC DIAMONDS

John C. Angus, Cleveland Heights, Ohio, assignor to Case Western Reserve University

Filed June 26, 1968, Ser. No. 740,226
Int. Cl. C01b *31/06*
U.S. Cl. 23—209.1 9 Claims

There is provided an improvement on a low-pressure process for the growth of synthetic diamonds from diamond seed crystals by contacting them with a monocarbon atom gas which also contains a "doping agent" such as a compound of boron or aluminum or lithium vapor in the gas phase at a pressure of from 760 (Torr.) to 1×10^{-1} (Torr.) and at a temperature in the range of from 900° C. to 1450° C. and for deposition-cleaning cycle periods in the range of from 4 to 28 hours.

3,630,678

DIAMOND GROWTH PROCESS

Nelson C. Gardner, Cleveland Heights, Ohio, assignor to Case Western Reserve University

Filed June 26, 1968, Ser. No. 740,227
Int. Cl. C01b *31/06*
U.S. Cl. 23—209.1 7 Claims

There is provided an improved process for the growth of diamonds on seed crystals with a gaseous polycarbon atom compound which is characterized by extremely low pressures not in excess of 1×10^{-2} (torr) and at temperatures in the range of 800° C. to 1,450° C. Interesting products including semiconductors and colored diamond crystals may be prepared by "doping" the gas with certain materials.

3,630,679

DIAMOND GROWTH PROCESS

John C. Angus, Cleveland Heights, Ohio, assignor to Case Western Reserve University

Filed June 26, 1968, Ser. No. 740,228
Int. Cl. C01b *31/06*
U.S. Cl. 23—209.1 14 Claims

There is provided an improved process for the growth of diamonds from seed crystal with a gaseous monocarbon atom compound which is characterized by extremely low pressures

not in excess of 1×10^{-2} (Torr.) and at temperatures in the range of 800° to 1,450° C. Interesting products including semiconductors and colored diamond crystals may be prepared by "doping" the gas with certain materials.

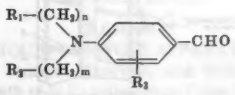
3,630,680

DIAGNOSTIC AGENTS FOR THE DETECTION OF UROBILINOGEN MATERIALS IN BODY FLUIDS

Walter Rittersdorf; Hans-Georg Rey, and Peter Rieckmann, all of Mannheim-Waldhof, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Oct. 18, 1968, Ser. No. 768,882
Claims priority, application Germany, Oct. 26, 1967, P 16 48 848.5 July 3, 1968, P 17 67 931.1
Int. Cl. G01n *21/06, 31/22, 33/16*
U.S. Cl. 23—230 B **22 Claims**

Diagnostic agents for use in the detection of urobilinogen materials in body fluids such as urine, the agents comprising at least one strong acid and at least one compound which reacts with urobilinogen materials present in the body fluids to provide analytically measurable dyestuffs wherein said compound has the formula:



in which R_1 and R_2 which may be the same or different, each represent halogen, cyano, nitroso, carbalkoxy, carbamido, hydroxy, acyloxy, alkoxy, straight-chained and cyclic, saturated and unsaturated secondary and tertiary amino, or R_1 and R_2 together represent oxygen, sulfur, sulfonyl, alkylthionium, imino, alkylimino, substituted or unsubstituted arylimino or open-chained, alicyclic or heterocyclic dialkylimino, R_2 can also represent the residue of secondary straight or branched, open-chained or mono- or polycyclic alkyl or aralkyl and wherein one of R_1 and R_2 can also represent hydrogen, R_3 is hydrogen or alkyl, and n and m which may be the same or different each have a value of 0, 1, 2 or 3.

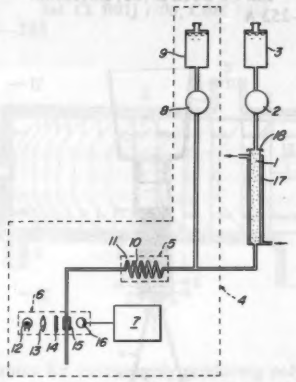
3,630,681

METHOD OF SEPARATING MIXTURES BY LIQUID CHROMATOGRAPHY

Yoshijiro Arikawa, Hitachi-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 393,539, Sept. 1, 1964, now abandoned. This application May 14, 1968, Ser. No. 742,993
Int. Cl. G01n *31/04, 31/08, 31/22*
U.S. Cl. 23—230 **27 Claims**

Method for separating components of a mixture by liquid chromatography, said components containing chemically coordinative groups, which comprises adsorbing weakly basic metal ions on an ion exchange resin column, introducing the mixture into said column, whereby complex compounds are formed between said metal ions and said coordinative groups, adding an eluting solution to said column, thereby separating the components of the mixture as their complexes and detecting the separated components eluted from the column. Detection is preferably effected by a color-developing reaction with said complexes. A further feature is to



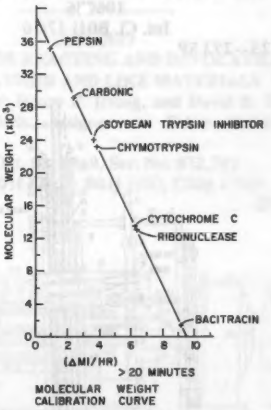
maintain a constant metal ion concentration on the column by using an eluting solution containing said metal ion.

3,630,682

DETERMINATION OF MOLECULAR WEIGHTS OF PROTEINS

Ralph A. Messing, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 21, 1970, Ser. No. 30,486
Int. Cl. G01n *31/06, 21/00, 33/00*
U.S. Cl. 23—230 R **4 Claims**

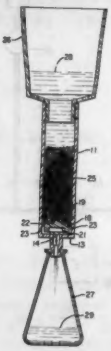


A method for determining the molecular weights of proteins by placing a dilute aqueous solution of the protein in contact with a porous 96 percent Silica glass membrane. At various time intervals, the percent loss of protein from solution to the membrane is calculated. A molecular weight of the protein is inversely proportional to the rate of molecular inclusion after a predetermined time.

3,630,683
REACTOR DEVICE FOR ION EXCHANGE RESINS AND THE LIKE

Wayne F. Robb, Aurora, Colo., assignor to Telan Corporation, Denver, Colo.

Filed Feb. 14, 1969, Ser. No. 806,339
Int. Cl. B01d 27/02; B01l 3/00
U.S. Cl. 23—253 A 11 Claims

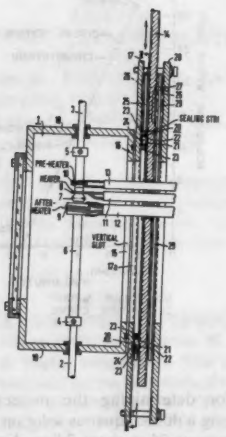


A reactor device includes a receptacle having a lower controlled orifice provided by an imperforate disclike member forming a narrow annular passage which confines materials to the receptacle and passes a liquid from the receptacle at a controlled, uniform rate. The device is applicable to the treatment of human matter such as whole blood or its derivatives and urine, to be analyzed in clinical or industrial laboratories.

3,630,684
DEVICE FOR HEATER MOVEMENT IN CRUCIBLE-FREE ZONE MELTING A CRYSTALLINE ROD

Wolfgang Keller, Pretzfeld, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 22, 1967, Ser. No. 669,979
Claims priority, application Germany, Sept. 24, 1966, S 106086
Int. Cl. B01j 17/10
U.S. Cl. 23—273 SP 3 Claims

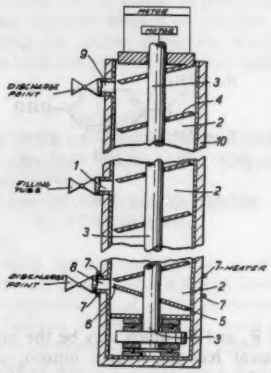


Device for crucible-free zone melting a crystalline rod includes a zone-melting chamber having a sidewall formed with a substantially vertical slot, heating means extending through said slot into said chamber and energizable for forming a melting zone in a substantially vertically supported crystalline rod mounted in said chamber, slide means located adjacent said sidewall and carrying said heating means, said slide means and said heating means being slidable together relative to the rod in the direction of the rod axis whereby the melting zone is passed through the rod, and an elastically deformable sealing strip mounted between said slide means and said sidewall of said zone melting chamber and completely surrounding said slot whereby said slot is gastightly sealed, said sealing strip being secured against displacement.

3,630,685
METHOD FOR THE TRANSPORTATION OF CRYSTALS AND MELT

Herman Schildknecht, Wilcken Str. 5, and Klaus Maas, Zuincke Str. 44, both of Heidelberg, Germany

Filed Nov. 12, 1969, Ser. No. 875,956
Claims priority, application Germany, Nov. 15, 1968, P 18 09 104.8 Nov. 15, 1968, P 18 09 105.9
Int. Cl. B01d 9/04
U.S. Cl. 23—273 F 7 Claims



Crystals and melt are transported in a crystallization column in countercurrent and in temperature gradient by a rotatable spiral having a plurality of turns. The spiral is disposed within an annular gap defined by the inner wall of the column and by a rod which is disposed within the column so that its axis is coincident with the column axis. The spiral extends substantially from the rod to substantially the inner wall of the column. The turns of the spiral run downwardly upon rotation of the spiral. The spiral has at its lower end one or more turns of opposite direction. The rod is rotatable about its longitudinal axis independent of the rotation of the spiral. This rotation is preferably in counterdirection to the direction of rotation of the spiral.

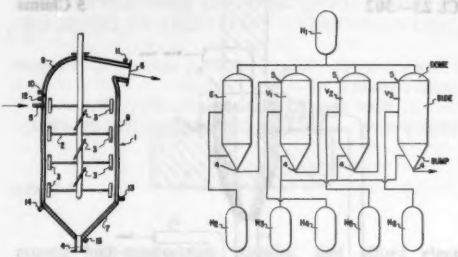
3,630,686
APPARATUS FOR CONTINUOUSLY POLYCONDENSING AND POLYMERIZING MONOMERS

Horst Rothert, Otternweg 15, Berlin 28, and Wolf Karasiak, Richterstrasse 17, Berlin 42, both of Germany

Original application June 4, 1968, Ser. No. 734,409, now abandoned. Divided and this application Dec. 8, 1969, Ser. No. 883,108 Claims priority application Germany, F 52625
Int. Cl. B01j 1/00; C08f 1/98; C08q 17/04
U.S. Cl. 23—283 4 Claims

An apparatus for continuously polycondensing and polymerizing monomers and, in particular, bis(2-hydroxyethyl) terephthalate. The condensation polymerization is carried out in a reactor vessel having a top portion, a verti-

cally oriented cylindrical side portion and a bottom portion and having rotatable vanes arranged inside the side portion for conveying downward a thin layer of the monomer located on the inside surface thereof. The top and bottom portions are provided with outlets for removing the released reaction



products and the final products, respectively. The method of the present invention includes the step of heating the top portion, the side portion and the bottom portion of the vessel to different temperatures and the apparatus includes means for so heating.

3,630,687

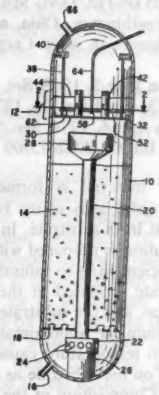
LIQUID DRAWOFF APPARATUS

Roger P. Van Driesen, Hopewell, and William R. Mounce, Cranbury, both of N.J., assignors to Cities Service Research and Development Company, New York, N.Y.

Filed Jan. 2, 1970, Ser. No. 196

Int. Cl. B01d *19/00;* **B01j** *1/00, 9/16*

U.S. Cl. 23—285 **7 Claims**



A liquid drawoff apparatus for use in combination with an operating upflow liquid phase reactor vessel is shown. The liquid drawoff apparatus comprises a transversely mounted plate in the upper portion of the vessel, having a number of risers extending up from holes in the plate, each riser having a horizontal row of orifices midway up the riser and a horizontal row of slots at the riser top, and a collector having a plurality of horizontally extending arms mounted at a level below the row of orifices and above the plate and connected to a liquid drawoff conduit. Each of the arms has a plurality of holes on its underside.

3,630,688

POLYMERIZATION APPARATUS

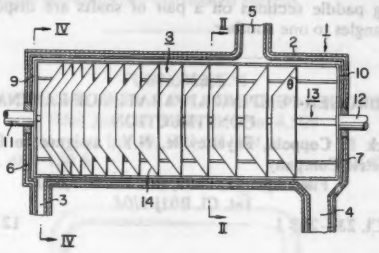
Teruo Takiguchi; Yoshihisa Fujimoto; Yoshio Kimura, and Iwao Terasaki, all of Nobeoka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1969, Ser. No. 866,326

Claims priority, application Japan, Nov. 27, 1968, 43/86336

Int. Cl. B01j *1/00;* **C08f** *1/98*

U.S. Cl. 23—285 **11 Claims**



An apparatus for continuously producing polymer having high degree of polymerization, comprising a substantially cylindrical vessel disposed in a substantially horizontal plane, said vessel having an inlet at its one end for supplying liquid reactant thereinto, an outlet at its other end for discharging polymer therefrom and a port or ports at its one or both ends or adjacent thereto for removing gas therefrom, and an agitator rotatably mounted in said vessel, said agitator including a pair of rotating shafts extending through end plates of the vessel on a central axis thereof, a pair of discs having diameter slightly smaller than the inside diameter of said vessel and connected to the inner ends of said rotating shafts, respectively, a plurality of rods extending in parallel with the central axis and connecting said discs and plurality of agitating members supported by said rods at spaced relationship in the vessel, each of said agitating members being made of an element constituting at least a part of a frustoconical member and having open ends, the bases of the agitating members being disposed at the outlet side of the vessel and their imaginary apex being disposed at the inlet side of the vessel.

3,630,689

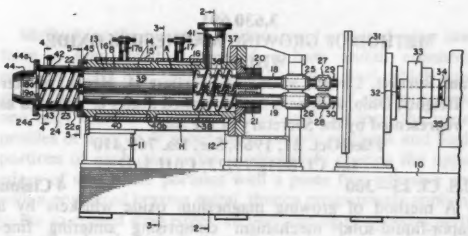
APPARATUS FOR REACTING AND DEVOLATILIZING PREPOLYMER AND LIKE MATERIALS

Dennis A. Wheeler; Henry F. Irving, and David B. Todd, all of Saginaw, Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Oct. 30, 1969, Ser. No. 872,701

Int. Cl. B01f *15/02;* **B01j** *1/00;* **C08g** *17/00*

U.S. Cl. 23—285 **27 Claims**



Multiscrew, corotating mixer shafts extend axially in a barrel and sets of interwiping self-cleaning lobular paddles or mixing elements on the shafts continuously wipe the barrel and primarily effect a radial as distinguished from an axial

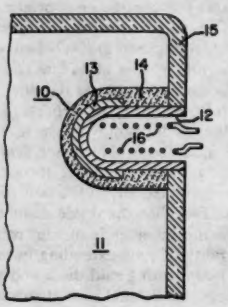
mixing. In the mixing zone, the lobes of the paddle portions are aligned over the length of the stage, so that axially continuous flow paths and vapor disengagement spaces are provided to a vapor drawoff vacuum duct situated at the material charging end of the barrel. The mixing stage is separated from a product discharge stage by dam means. In the mixing stage a predetermined amount of material is supplied to the barrel which is maintained only partly full of the material which is fed continuously through the machine. Preferably the paddle sections are lens shaped in cross section and interwiping paddle sections on a pair of shafts are disposed at right angles to one another.

3,630,690

HYDROGEN-PUMPING APPARATUS OF LAMINATED CONSTRUCTION

Patrick P. Coppola, Fayetteville, N.Y., assignor to General Electric Company

Filed Apr. 21, 1969, Ser. No. 817,640
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 J **12 Claims**



An exhaust pump of laminar construction employs a palladium substrate and an intermediate layer of titanium between the substrate and a hydrocarbon cracker catalyst layer. The catalyst layer is exposed to a region being evacuated of gas including hydrogen, while the palladium substrate is exposed to the atmosphere. The combination of materials, operated at an elevated temperature, results in efficient hydrocarbon cracking, hydrogen pumping, and sorption of other gases.

3,630,691

METHOD OF GROWING MAGNESIUM OXIDE WHISKERS

Paul Burnett, Lowell, Mass., and Arthur H. Heuer, Shaker Heights, Ohio, assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 21, 1968, Ser. No. 769,410
Int. Cl. B01g *17/22*; **C01f** *5/02*
U.S. Cl. 23—300 **4 Claims**

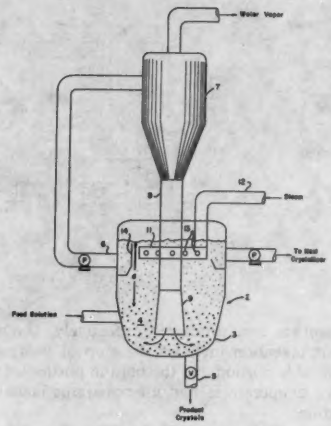
A method of growing magnesium oxide whiskers by a vapor-liquid-solid mechanism comprising sintering fine-grained polycrystalline magnesium oxide having a selected impurity element therein and then annealing the sintered product whereby the impurity element forms a liquid solution with the magnesium oxide and crystal growth occurs by precipitation from the supersaturated liquid at the solid-liquid interface.

3,630,692

METHOD OF PRODUCING LARGE KC1 CRYSTALS

Raymond C. Green, and Joseph E. Trachta, both of Hobbs, N. Mex., assignors to Kerr-McGee Corporation

Filed Jan. 26, 1968, Ser. No. 700,988
Int. Cl. B01d *9/02*
U.S. Cl. 23—302 **5 Claims**



A method of increasing the size of crystals produced in a crystallizing vessel having a bed of growing crystals suspended therein. Live steam is added to the solution within the crystallizing vessel at a point above the bed of growing crystals to dissolve a major portion of the fines which are circulating in the solution.

3,630,693

INFRARED DETECTING MATERIALS

Jerry W. Moody, Worthington, Ohio, and Francis J. Reid, Syosset, N.Y., assignors to Avco Corporation, Cincinnati, Ohio

Original application June 5, 1968, Ser. No. 734,715, now Patent No. 3,558,373, dated Jan. 26, 1971. Divided and this application Apr. 6, 1970, Ser. No. 31,063
Int. Cl. B32b *15/00*
U.S. Cl. 29—194 **4 Claims**

Infrared detector material is formed by the epitaxial growth of a single crystal alloy of the two III–V compounds InAs and InSb on an InAs substrate. In the method of such growth, a liquid solution is prepared with excess indium solvent, InSb, and sufficient InAs to saturate the indium at 500° C. The InAs substrate, oriented in the III direction is immersed in the solution, and the substrate and the solution are brought to equilibrium at approximately 500° C. Slowly lowering the solution temperature causes a single crystal to be epitaxially grown on the substrate as a solid homogeneous InAs-InSb solution. Composition of the crystal is a function of solution composition and may be controlled by dissolving selected quantities of InSb in the solution.

3,630,694

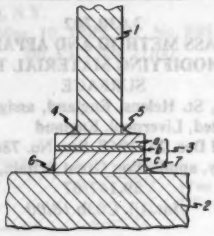
ALUMINUM/FERRITIC STAINLESS STEEL/STEEL COMPOSITES

Thomas J. Enright, Woodbury Heights, N.J., and Sadun S. Tor, Phoenix, Md., assignors to E. I. duPont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1969, Ser. No. 872,095
Int. Cl. B32b *15/18*, *15/20*; **B23p** *3/09*
U.S. Cl. 29—196.2 **10 Claims**

Metal composites in which a layer of ferritic stainless steel having a yield strength of up to about 60,000 p.s.i. before

bonding is metallurgically bonded to, and sandwiched between, a layer of aluminum and a layer of steel, have improved high-temperature stability, and afford electrical transition joints of better high-temperature capability than aluminum/steel transition joints heretofore known.



3,630,695

FUEL COMPOSITION

Irl N. Duling, and Richard D. Cassar, both of West Chester, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed July 9, 1969, Ser. No. 840,530
Int. Cl. C10l 9/00
U.S. Cl. 44—1 R 2 Claims

A solid fuel composition comprising paraffin wax having 1.1 to 25 weight percent of polyethylene with a molecular weight in the range of 500,000 to 6,000,000 uniformly distributed therein, is useful for supplying heat to protect living plants susceptible to injury by low ambient air temperature. This composition is self-supporting, burns without smoke, and burns completely leaving little or no residue. In addition a large mass of this composition ignites easily.

3,630,696

COMBUSTION ADJUVANT

Maclin R. Milner, Clearwater, and Frederick B. Johnston, Tampa, both of Fla., assignors to Trimex Corporation, Clearwater, Fla.

Continuation-in-part of application Ser. No. 852,867, Aug. 25, 1969. This application Oct. 27, 1969, Ser. No. 869,866
Int. Cl. C10l 9/00, 1/32
U.S. Cl. 44—4 12 Claims

An adjuvant for hydrocarbon fuels is provided comprising a calcium based montmorillonite clay, a phosphate, and a source of boron oxide. A preferred formulation comprises 85 weight percent calcium bentonite, 10 weight percent anhydrous trisodium phosphate, and 5 weight percent sodium borate. The adjuvant is combined with the hydrocarbon fuel or with combustion air in an amount of about 0.1 to 2.0 weight percent, based on the weight of the hydrocarbon fuel. Combustion efficiency is substantially improved and oxidation is substantially more complete, so that combustion products are produced in less noxious forms. In addition, the nature of slag or other deposits upon surfaces in a furnace or combustion chamber are substantially altered, so that corrosive conditions do not occur and the deposition of slag is prevented or materially reduced, and the ash is produced in a soft, friable form.

3,630,697

WICKLESS CANDLES

Irl N. Duling, and Richard D. Cassar, both of West Chester, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed July 9, 1969, Ser. No. 840,529
Int. Cl. C10l 5/00
U.S. Cl. 44—7.5 2 Claims

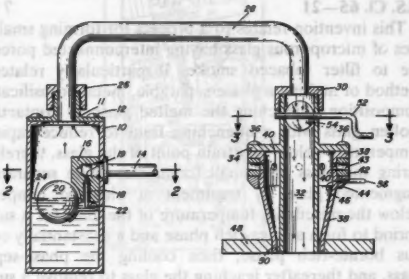
A wickless candle can be formed from a composition comprising 45 to 97.9 weight percent wax, 1 to 30 weight percent stearic acid and 1.1 to 25 weight percent ultrahigh molecular weight polyethylene. The wickless candle is easily ignitable, burns with little or no dripping and leaves little residue upon complete combustion. The wax can be a paraffin wax or a combination of paraffin wax and one or more of the following waxes: candellilla, carnauba, montan, spermaceti and beeswax. The ultrahigh molecular weight polyethylene refers to a polyethylene with a weight average molecular weight in the range of 500,000 to 6,000,000. The components of the composition are uniformly distributed therein.

3,630,698

FUEL SYSTEM

Joseph H. Baldwin, Route 4, Box 305-A-2, Waycross, Ga.

Filed Jan. 21, 1970, Ser. No. 4,509
Int. Cl. F02m 21/04
U.S. Cl. 48—180 R 5 Claims



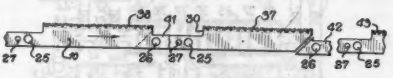
A fuel system constructed to furnish gaseous fuel, rather than liquid fuel, to an internal combustion engine. The delivery system converts liquid fuel to its gaseous state by lowering the pressure on the surface of the liquid, thereby causing the liquid to boil thereby providing the vapor which is fed to a venturi and thence into the intake manifold.

3,630,699

METHOD FOR PRODUCING ARMORED SABER SAWS

Robert T. Catlin, Trumbull, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Continuation-in-part of application Ser. No. 703,931, Feb. 8, 1968. This application Sept. 2, 1969, Ser. No. 854,654
Int. Cl. B24d 15/02, 17/00
U.S. Cl. 51—293 12 Claims



Method for the quantity production of armored saber saws from a long flexible strip of a base metal, consisting preferably of a heat treatable steel or alloy steel, which comprises: progressively punching out portions of said strip along one edge thereof at equispaced intervals to form the upper profiles of a series of saber saws comprising shank and blade portions of each, thereafter progressively coating the upper edges of said blade portions with a paste flux adhesive and with a powdered brazing metal, thence progressively applying to the so-coated strip edges, an overcoating of abrasive particles of a hard, high-melting diamond substitute material, thence progressively heating said strip at relatively low temperature to dry said paste flux and thence at temperature sufficiently high to austenitize said base metal and to fuse said matrix metal particles to one another and into a coating layer on said base metal, partially embedding said abrasive particles therein, thence progressively cooling said strip to tem-

perature sufficiently low and with sufficient rapidity to transform said austenite to martensite and to solidify said matrix metal layer and permanently to bond the same to said base metal and to retain said abrasive particles permanently embedded in said matrix metal layer, thereafter progressively subjecting said strip to a tempering heat treatment, and thereafter punching out portions of said strip along the opposite edge thereof to form the lower profiles of said series of said saws and/or to sever said strip into finished saber saws.

3,630,700

PROCESS FOR FORMING PARTICLES OF MICROPOROUS GLASS FOR TOBACCO SMOKE FILTERS

Joseph J. Hammel, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 6, 1969, Ser. No. 822,297
Int. Cl. C03b *21/00*; C03c *15/00*
U.S. Cl. 65—21 **7 Claims**

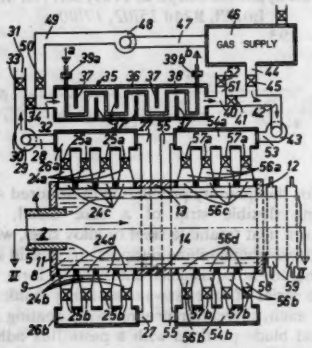
This invention relates to a process for forming small particles of microporous glass having interconnected pores suitable to filter tobacco smoke. It particularly relates to a method of melting a phase-separable, metal borosilicate glass composition, quenching the melted glass by contacting the molten glass with a quenching fluid to reduce rapidly the temperature below the strain point of the glass, thereby fracturing the glass into small fragments, phase separating the fragmented glass by treatment at elevated temperatures below the miscibility temperature of the glass for a sufficient period to form a silica-rich phase and a substantially continuous borate-rich phase, then cooling the phase-separated glass, and thereafter leaching the glass to remove a sufficient quantity of the borate-rich phase to form microporous particles having interconnected pores.

3,630,701

METHOD AND APPARATUS FOR MANUFACTURING FLAT GLASS ON A BATH OF MOLTEN METAL

Gustave Javaux, Brussels; Gilbert Doquire, Spy, and Marcel Bodart, Namur, all of Belgium, assignors to Glaverbel, Watermael-Boitsfort, Belgium

Filed June 23, 1969, Ser. No. 835,584
Claims priority, application Luxembourg, July 24, 1968, 56.578
Int. Cl. C03b *18/02*
U.S. Cl. 65—27 **22 Claims**



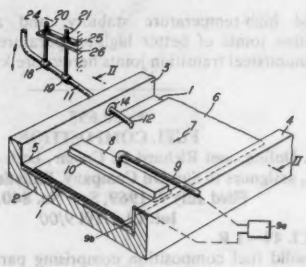
Flat glass is manufactured on a bath of molten material in a partially closed chamber with the glass being cooled as it moves over the molten bath. A gas is circulated within the chamber to maintain a protective atmosphere therein. At least a portion of the circulated gas is withdrawn from one place in the chamber above the molten gas, subjected to a treatment which may be cooling or purifying, and then reintroduced into the chamber at another place above the bath so as to recycle the protective gas.

3,630,702

FLOAT GLASS METHOD AND APPARATUS FOR SUPPLYING MODIFYING MATERIAL TO THE GLASS SURFACE

Jack Lawrenson, St. Helens, England, assignor to Pilkington Brothers Limited, Liverpool, England

Filed Dec. 24, 1968, Ser. No. 786,722
Claims priority, application Great Britain, Dec. 29, 1967, 59,147/67
Int. Cl. C03b *18/00*
U.S. Cl. 65—30 **9 Claims**



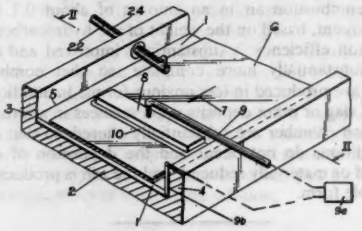
Float glass having a desired characteristic is made by maintaining a body of molten material which modifies the glass in contact with a surface of the glass to produce the characteristic while there is relative movement between the glass and the body, and supplying said material onto the glass surface upstream of the body so that the body is replenished in the course of the relative movement.

3,630,703

FLOAT GLASS METHOD AND APPARATUS FOR SUPPLYING MODIFYING MATERIAL TO THE GLASS SURFACE

David Jones, St. Helens, England, assignor to Pilkington Brothers Limited, Liverpool, England

Filed Jan. 3, 1969, Ser. No. 788,725
Claims priority, application Great Britain, June 19, 1968, 29,189/68
Int. Cl. C03b *18/00*
U.S. Cl. 65—30 **7 Claims**



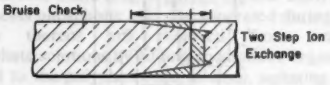
Float glass having a desired characteristic is manufactured by advancing the glass beneath a body of molten material which modifies the glass to produce the characteristic, and feeding a strip of replenishing material to the glass surface upstream of the body so that the end of the strip melts on to the glass surface and the molten material is carried into the molten body as the glass advances.

3,630,704

METHOD FOR STRENGTHENING GLASS ARTICLES

Harmon M. Garfinkel, Horseheads, and Joseph S. Olcott, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 10, 1969, Ser. No. 805,457
Int. Cl. C03c *21/00*
U.S. Cl. 65—30 7 Claims



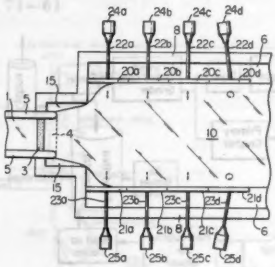
This invention relates to the production of chemically strengthened sodium and/or potassium silicate glass articles utilizing a consecutive ion exchange reaction involving ion exchange media containing lithium ions. In carrying out the process of the invention, a surface of the glass article is first contacted with an external source of lithium ions at a temperature above the strain point of the glass but below the softening point thereof and, thereafter, this surface is contacted with an external source of lithium ions at a temperature above 200° C. but below the strain point of the glass.

3,630,705

METHOD OF MANUFACTURING FLAT GLASS ON MOLTEN METAL AND APPARATUS THEREFOR

Masaaki Owa, Amagasaki-shi, Japan, assignor to Asahi Glass Co., Ltd., Tokyo, Japan

Filed May 19, 1969, Ser. No. 825,755
Claims priority, application Japan, May 28, 1968, 43/35730
Int. Cl. C03b *18/00*
U.S. Cl. 65—99 A 9 Claims



In the manufacture of flat glass by the "float process" in which glass is advanced and flattened in ribbon form on a molten metal bath, vibrations of sonic or ultrasonic frequencies are applied to members which are in contact, or may come in contact, with the glass ribbon afloat on the molten metal bath, thereby decreasing the friction between the glass and said members and preventing the glass from sticking to the members.

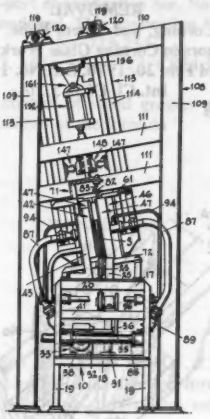
The aforementioned members include, for example, glass-width regulating members, water-cooled fences, restrictor tiles or/and the sidewall linings of the elongated tank containing said molten metal bath.

3,630,706

METHOD AND APPARATUS FOR BENDING AND TEMPERING GLASS SHEETS

Waldemar W. Oelke, Rossford; Frank J. Carson, and Alfred E. Badger, both of Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Continuation of application Ser. No. 365,275, May 6, 1964, now abandoned. This application Mar. 18, 1968, Ser. No. 714,114
Int. Cl. C03b *23/02, 25/04*
U.S. Cl. 65—104 12 Claims



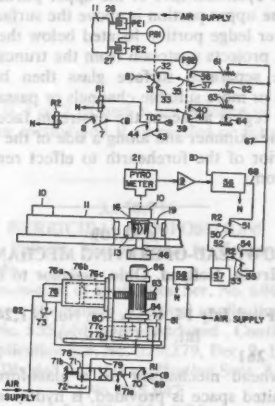
Bending and tempering glass sheets by first directing opposed flows of heated gases against a sheet to heat the glass and to support the sheet in a substantially vertical plane, then pressing the heated glass sheet between complemental shaping surfaces to the desired curvature, and finally directing opposed flows of cooling gases against the sheet to reduce its temperature and support it in the said plane.

3,630,707

TEMPERATURE CONTROL SYSTEM FOR GLASS-SHAPING MOLDS

Daniel R. Ayers, Shelburne, Vt., assignor to Corning Glass Works, Corning, N.Y.

Filed June 11, 1969, Ser. No. 832,320
Int. Cl. C03b *9/38, 11/02*
U.S. Cl. 65—162 8 Claims



A system for automatically sensing and controlling the temperature of each of a plurality of molds to within a

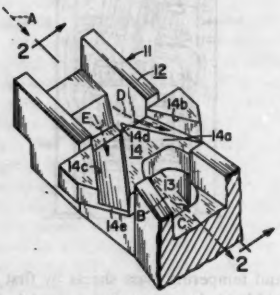
desired temperature range therefor, each such mold having a cooling fluid control valve associated therewith and each mold being intermittently positioned at a station where each respective valve is adjusted in accordance with an adjustment signal produced by comparing a signal representing the sensed temperature of the respective mold and a set point signal representing the desired temperature for such mold.

3,630,708

FOREHEARTH SURFACE-GLASS SEPARATION AND REMOVAL

Allen C. Ihrig, Corning, and Villem Rahe, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 20, 1970, Ser. No. 12,939
Int. Cl. C03b 5/20
U.S. Cl. 65—168 **4 Claims**



Apparatus for separating surface glass from a parent body of molten glass flowing through a forehearth and, thereafter, removing such surface glass from the forehearth. A stationary skimmer is positioned in the forehearth to interfere with or divert the flow of the surface glass and thereby separate such glass from the remainder of the parent body thereof. The skimmer has an upper portion having a horizontal planar configuration of a truncated triangle with the truncated face being on the upstream face of the upper portion. The upper surface of the upper portion is above the surface level of the glass. A lower ledge portion located below the surface level of the glass, projects upstream from the truncated face. The flow of the separated surface glass then being directed through one or more suitable channels or passages which extend from a region adjacent the upstream face of the upper portion of the skimmer and along a side of the upper portion to the exterior of the forehearth to effect removal of such glass therefrom.

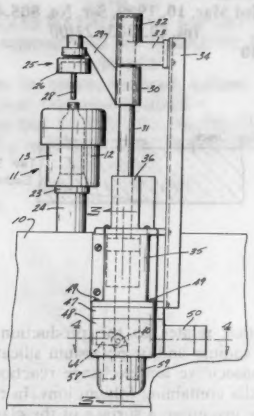
3,630,709

BLOWHEAD-OPERATING MECHANISM

George W. Irwin, Holland, Ohio, assignor to Owens-Illinois, Inc.

Filed July 14, 1969, Ser. No. 841,248
Int. Cl. C03b 9/40
U.S. Cl. 65—261 **9 Claims**

The blowhead mechanism on a glass-forming machine wherein limited space is provided, is hydraulically operated so as to move the blowhead from a parked position by a horizontal swinging motion followed by a vertically downward motion into blow position. Retraction of the blowhead is carried out in the precise reverse order. Separate reciprocating motors, actuated simultaneously, through a dual cam and follower arrangement, control the movement



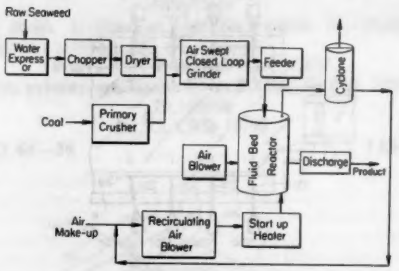
of the blowhead support so as to operate the head from the blow position to the parked position and return.

3,630,710

PRODUCTION OF METABOLIC DEMAND SEAWEED-TYPE FERTILIZER

Arman F. Frederickson, Englewood, Colo., assignor to Mary Maxine Frederickson, Houston, Tex.

Continuation-in-part of application Ser. No. 575,710, Aug. 29, 1966, now abandoned. This application Jan. 31, 1969, Ser. No. 795,456
Int. Cl. C05f 11/00, 11/02
U.S. Cl. 71—23 **4 Claims**



A metabolic demand nitrogenous fertilizer or fertilizer base which releases nutrients into the soil in a controlled manner and in response to soil deficiencies is prepared by a process comprising the partial oxidation of organic materials at carefully controlled conditions of time, temperature and supplies of an oxidizing gas in a fluidized zone. Starting materials for the process include coal, bituminous or anthracitic, peat-moss, high chlorophyll content organic materials such as seaweeds, grasses, plant tops such as potato plant tops, sugar beet tops, and the like, seaweeds being a particularly effective type of material treated.

Nitrogen, potassium, phosphorous, and sulfate values may be added to the partially oxidized organic materials by reaction with the corresponding element supplying materials.

3,630,711

CLARIFICATION OF AMMONIUM POLYPHOSPHATE SOLUTIONS

George M. Burkert, Shelby, N.C., and John D. Nickerson, Atlanta, Ga., assignors to United States Steel Corporation

Continuation-in-part of application Ser. No. 791,522, Jan. 15, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 470,909, July 9, 1965, now abandoned. This application June 30, 1970, Ser. No. 51,345

Int. Cl. C05b *7/00*; C01b *25/28*

U.S. Cl. 71—34 6 Claims

Carbonaceous chars resulting from organic matter present in wet process phosphoric acid and generated during the concentration thereof are removed from ammonium polyphosphate solutions by adding an aliphatic organic amine compound to the polyphosphate solution, agitating the mixture and holding the solution until the solids flocculate and float as a froth to the surface, permitting removal of the solids with the froth.

3,630,712

STABILIZED AMMONIUM NITRATE COMPOSITIONS

Marion Lipscomb Brown, Jr.; Albert Wise Green, and Elmer Ladelle Blanton, all of Yazoo, Miss., assignors to Mississippi Chemical Corporation, Yazoo City, Miss.

Filed Mar. 12, 1969, Ser. No. 806,733

Int. Cl. C05c *1/02, 3/00*

U.S. Cl. 71—59 1 Claim

Stabilized ammonium nitrate in crystallized mixture with amounts of boric acid, diammonium phosphate, and ammonium sulfate in proportions which markedly reduce the physical sensitivity of the ammonium nitrate to II-IV and/or III-IV crystal-type transitions and its use in particulate ammonium nitrate production to reduce dust formation.

3,630,713

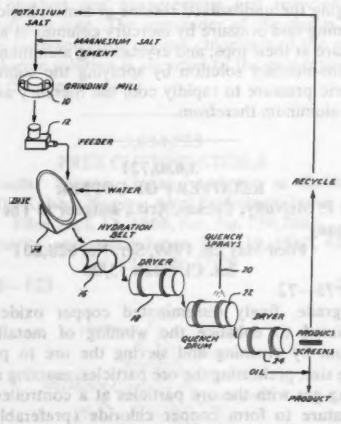
METHOD OF PRODUCING FERTILIZER GRANULES

Ben E. Adams; William H. Lawhon, and Billy C. Phillips, all of Carlsbad, N. Mex., assignors to Duval Corporation, Houston, Tex.

Filed July 22, 1968, Ser. No. 746,452

Int. Cl. C05d *1/00, 5/00*

U.S. Cl. 71—61 9 Claims



A method of producing competent granules of a potassium salt fertilizer which includes the steps of grinding and granulating the material with an easily dehydrated magnesium salt and Portland cement allowing time for hydration of the granules, filling the voids of the granules with an inorganic salt solution and lightly coating the granules with a coating liquid and wherein the method may be conducted without either or both of the last two steps and may be conducted without the addition of the magnesium salt and Portland cement and the hydration step.

3,630,714

METHOD FOR CONTROLLING UNDESIRABLE VEGETATION USING 2-NITRO-3-PYRIDOLS OR THEIR SALTS OR ESTERS

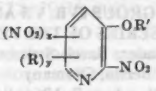
Roy C. De Selms, Rochester, N.Y., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 510,677, Nov. 30, 1965, now abandoned. This application Apr. 5, 1968, Ser. No. 719,254

Int. Cl. A01n *9/14, 9/22*; C07d *31/24*

U.S. Cl. 71—94 7 Claims

Preemergence control of weed grasses and broad-leaved weeds using compounds of the formula



wherein *x* is 0 or 1, R is lower alkyl, F, Cl or Br, *y* is 0, 1, 2 or 3 and R′ is hydrogen, a positive salt-forming group or an organic ester group such as carboxyacyl, sulfonyl, carbamyl, carbonate or thiocarbonate.

3,630,715

ALKYLENE BIS (PHENOXYACETIC ACID) DERIVATIVES AS HERBICIDES

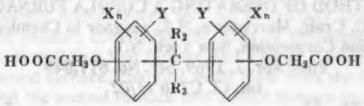
Alvin Guttag, Bethesda, Md., assignor to Weston Chemical Corporation, New York, N.Y.

Filed Dec. 19, 1968, Ser. No. 785,404

Int. Cl. A01n *9/24*

U.S. Cl. 71—109 8 Claims

Herbicides and insecticides of the formula



where *n* is 0, 1 or 2, X and Y are halogen or hydrogen, R_2 is hydrogen or methyl and R_3 is methyl or trihalomethyl are provided.

3,630,716

HERBICIDAL COMPOSITIONS

John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 680,598, Sept. 15, 1967, now abandoned , Original application Mar. 21, 1966, Ser. No. 535,664, now abandoned , Continuation-in-part of application Ser. No. 329,279, Dec. 9, 1963, now abandoned. Divided and this application Sept. 3, 1969, Ser. No. 855,047

Int. Cl. A01n *9/20*

U.S. Cl. 71—118 13 Claims

Herbicidal composition and method utilizing as active ingredient one or more N-alphahaloalkylanilide.

3,630,717

METHOD AND COMPOSITION FOR STIMULATING PLANT GROWTH

George T. Miller, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of application Ser. No. 603,700, Dec. 1, 1966, now Patent No. 3,472,647, dated Oct. 14, 1969. This application Oct. 3, 1969, Ser. No. 863,687

Int. Cl. A01n *9/24*

U.S. Cl. 71—122 **8 Claims**

A method is described for stimulation of plant growth employing lower aliphatic alcohols of from one to six carbon atoms as the growth stimulating agent. The alcohol may also be used in an aqueous solution. Growth stimulation is also produced by employing an aqueous alcoholic solution in which soil, in which plants have grown, or plants have been placed and removed when the lower aliphatic alcohol is no longer present.

3,630,718

NONPYROPHORIC METAL POWDER OF A METAL FROM THE GROUP IVB, VB AND VIB OR THE ACTINIUM SERIES OF THE PERIODIC TABLE

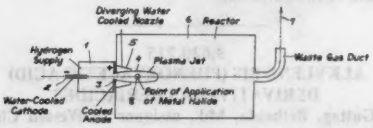
Ernst Neuenschwander, Basel, Switzerland, assignor to Hermann C. Starck, Berlin, Germany

Original application June 7, 1966, Ser. No. 555,904, now Patent No. 3,480,426, dated Nov. 25, 1969. Divided and this application Mar. 20, 1969, Ser. No. 841,165

Claims priority, application Switzerland, June 25, 1965, 8950/65

Int. Cl. B22f *9/00*

U.S. Cl. 75—0.5 **1 Claim**



A nonpyrophoric metal powder of Group IV*b*, Group V*b*, Group VI*b* or the actinium series of the Periodic Table, having a particle size of 0.03 to 0.1 micron and a low surface area to volume ratio.

3,630,719

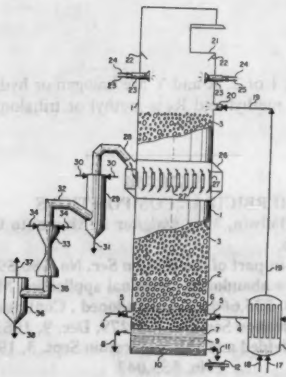
METHOD OF OPERATING A CUPOLA FURNACE

Robert C. Craig, Morristown, N.J., assignor to Chemical Construction Corporation, New York, N.Y.

Filed Apr. 1, 1969, Ser. No. 811,849

Int. Cl. C21b *11/02*

U.S. Cl. 75—43 **4 Claims**



The formation of an explosive gas mixture in the operation of a ferrous metallurgical furnace such as a vertical cupola furnace or the like is prevented, by injecting an inert gas stream into the upper part of the furnace below the charge inlet, to prevent air from flowing into the upper part of the furnace through the charge inlet, and thereby preventing the formation of an explosive gas mixture of air with process gas, which is rich in carbon monoxide and is withdrawn from the side of the furnace below the upper charge inlet.

3,630,720

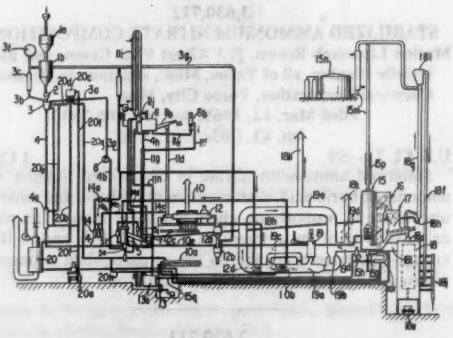
PROCESS FOR THE EXTRACTION OF ALUMINUM FROM ITS ALLOYS

Georg Messner, Latemar Strasse 7, 8000 Munich 90, Germany

Continuation-in-part of application Ser. No. 394,873, Sept. 8, 1964, now abandoned. This application Mar. 17, 1969, Ser. No. 807,707

Int. Cl. C22b *21/06*

U.S. Cl. 75—68 R **21 Claims**



Describes a process of recovering relatively pure aluminum from an aluminum alloy by charging solid aluminum alloy particles into a circulating mercury stream at atmospheric pressure, transporting the mixed stream downwardly to a melting and extraction zone maintained at a temperature of about 485° to 530° C. and a pressure of about 11 atmospheres, adding additional mercury to the extraction zone, discharging the undissolved residue at atmospheric pressure, maintaining said pressure by mercury columns at atmospheric pressure at their tops, and crystallizing aluminum from the aluminum-mercury solution by spraying the solution at atmospheric pressure to rapidly cool the mercury and crystallize the aluminum therefrom.

3,630,721

RECOVERY OF COPPER

Terence P. McNulty, Tucson, Ariz., assignor to The Anaconda Company

Filed May 26, 1969, Ser. No. 828,801

Int. Cl. C22b *15/00*

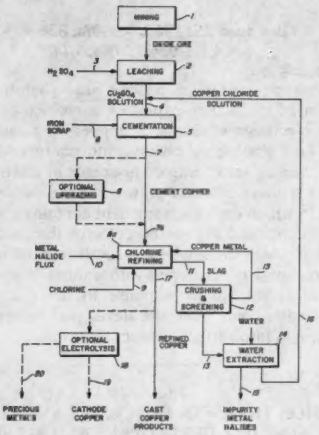
U.S. Cl. 75—72 **10 Claims**

Low-grade, finely disseminated copper oxide ores are beneficiated to enhance the winning of metallic copper therefrom by crushing and sieving the ore to particles of suitable size, preheating the ore particles, reacting a chlorine-donating gas with the ore particles at a controlled elevated temperature to form copper chloride (preferably cuprous chloride) therein and maintain it substantially in molten liquid form, and then reducing the molten liquid copper chloride at the elevated temperature to metallic copper with a reducing gas. Further benefits are derived by carrying out the preheating step in a reducing or oxidizing atmosphere, and by passing an oxidizing gas through the ore particles after chlorination and before reduction to metallic copper. Apparatus is also described for carrying out the foregoing processes continuously.

3,630,722
COPPER-REFINING PROCESS

Frank D. Chew, 4320 North 63rd Ave., Phoenix, Ariz.

Filed Oct. 13, 1969, Ser. No. 865,672
Int. Cl. C22b *15/08, 15/12, 15/14*
U.S. Cl. 75—76 1 Claim

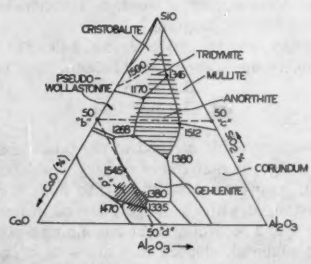


In an integrated process, copper-bearing materials are leached with dilute sulfuric acid and the dilute pregnant leach solution is reacted with ferrous scrap to produce cement copper precipitate containing copper metal, ferrous impurities and normally refractory metal impurities. The raw cement copper is preliminarily treated to separate portions of the ferrous impurities and is then melted and reacted with chlorine under a metal halide flux cover. The chlorine selectively reacts with the refractory metals and the ferrous impurities, forming chlorides which are dissolved by the halide flux to produce a slag containing entrained copper metal, copper chloride and the impurity metal chlorides. After separation of the substantially pure copper metal remaining in the melt, the readily friable slag is cooled to solidification and crushed. Entrained copper metal particles are removed from the crushed slag by screening and recycled to the chlorine refining step. The remainder of the slag is leached with water to dissolve the copper chloride and the pregnant copper chloride solution is recycled to the cementation step to recover the copper values.

3,630,723
FREE CUTTING STEELS

Chiaki Asada, Nagoya, Japan, assignor to Daido Seiko Kabushiki Kaisha, Nagoya, Aicci Prefecture, Japan

Filed Sept. 13, 1968, Ser. No. 759,706
Claims priority, application Japan, Sept. 19, 1967, 42/59620
Int. Cl. C22c *37/00*
U.S. Cl. 75—123 2 Claims



This invention relates to free-cutting carbon steels such as S20C steel, S30C steel, S45C and S55C steel as indicated by the Japanese Industrial Standards (or steel Nos. 1020 to 1055 as indicated by the SAE Standards) containing 0.20 to 0.56 percent carbon, 0.24 to 0.33 percent silicon and 0.35 to 0.78 percent manganese. Also, this invention relates to free-cutting Ni-Cr steels, Cr-Mo steels and Cr steels containing 0.29 to 0.42 percent carbon, 0.24 to 0.33 silicon, 0.51 to 0.75 percent manganese, 0.07 to 2.89 percent nickel, 0.76 to 1.14 percent chromium and 0 to 0.26 percent molybdenum. They are characterized by the oxide inclusion contained in them, and also the calcium content and the improved free-cutting characteristic.

3,630,724
ALLOY HAVING A LOW THERMAL EXPANSION COEFFICIENT AND A HIGH SPRING BENDING LIMIT

Toshinari Hirayama, Kokubunji-shi; Hideharu Ohara, Tokyo, and Noboru Ichiyama, Kokubunji-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1969, Ser. No. 814,995
Claims priority, application Japan, Apr. 17, 1968, 43/25,221
Int. Cl. C22c *39/36, 39/50, 39/54*
U.S. Cl. 75—123 K 9 Claims

A material having a low thermal expansion coefficient (a linear thermal expansion coefficient of less than about 7×10^{-6}/° C) and a high spring bending limit (more than about 64 kg./mm.^{2}) has been demanded for mechanical or electronic device, physicochemical machine, industrial measurement device. A nickel-iron alloy which consists essentially of 33–46 percent of Ni, 0.1–5 percent of Ti, 0.5–5 percent of Mo and the balance iron and has a linear thermal expansion coefficient of (2.2–7.1) $\times10^{-6}$/° C and a spring bending limit of 64–125 kg./mm.^{2} is obtained as a material which suffices said demand.

3,630,725
METHOD OF PREPARING AN ALUMINUM ALLOY

Daniel B. Cofer, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Continuation-in-part of application Ser. No. 608,507, Jan. 11, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 557,392, June 14, 1966, now abandoned.
This application Aug. 6, 1969, Ser. No. 848,112
Int. Cl. C22c *1/02*
U.S. Cl. 75—138 8 Claims

A method of preparing an aluminum alloy which may be subsequently manufactured into an electrically conductive wrought product comprising the steps of preparing a pure aluminum melt in a first furnace and a scrap aluminum melt in a second furnace, charging melts from both the first furnace and the second furnace into a third furnace to produce a third melt having alloy constituents which fall within a prescribed formula, and fluxing the third melt. The present method permits the use of relatively inexpensive scrap materials to produce a useful material which may be formed into electrically conductive wrought products.

3,630,726
MAGNESIUM BASE ALLOYS

Philip Andrew Fisher, and William Unsworth, both of Manchester, England, assignors to Magnesium Elektron Limited, Swinton, Manchester, England

Filed June 24, 1969, Ser. No. 836,143
Claims priority, application Great Britain, June 26, 1968, 30,395/68
Int. Cl. C22c *23/00*
U.S. Cl. 75—168 7 Claims

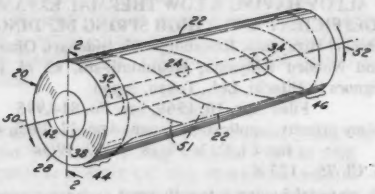
This invention provides magnesium base alloys having improved mechanical properties especially in the as cast state and consisting essentially, apart from impurities, of 6 to 12 percent by weight aluminum, from 0 to 3 percent by weight zinc, and at least 0.5 percent of each of silicon and manganese, the total content of silicon and manganese being 1.2 to 1.8 percent, and having a Mn/Si ratio of 0.6 to 1.5; balance magnesium.

3,630,727

APPARATUS AND METHOD FOR PRESSURIZING MATERIALS

Peter F. Rossmann, 134 Merriweather Road, Grosse Pointe Farms, Mich.

Filed Sept. 11, 1967, Ser. No. 666,674
Int. Cl. B22f 3/02, 3/16
U.S. Cl. 75—214 8 Claims



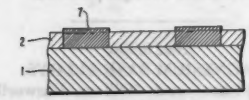
A method of treating materials, and apparatus for use in the method, wherein a high-pressure torsion press in the form of a heavy wall tube having a coaxial throughbore is loaded with a charge of raw material and then the charge is confined by seal plugs secured at the ends of the bore. High pressures are exerted on the material by applying oppositely directed torsional couples to the opposite ends of the tube. This counterrotational torsional stress tends to twist the tube which in turn tends to axially shorten and radially contract the charge cavity so that the walls of the cavity apply omnidirectional compression forces on the charge of a very high magnitude. The charge is preferably also heated for a suitable time period while being pressurized to convert the charge to crystalline form, e.g., graphite to diamonds, or to otherwise modify its properties.

3,630,728

ELECTROPHOTOGRAPHIC METHOD OF FORMING RELIEF IMAGES

Yasuo Tamai, and Satoru Honjo, both of Asaka-shi, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun Kanagawa, Japan

Filed Feb. 24, 1969, Ser. No. 801,303
Claims priority, application Japan, Feb. 21, 1968, 43/10874
Int. Cl. G03g 13/22
U.S. Cl. 96—1 14 Claims



Producing a resist by forming an electrostatic latent image on a photoconductive insulating layer containing a resin binder on a base, developing the latent image with a granular toner containing a substance miscible with the resin binder, permeating the miscible substance contained in the toner into the photoconductive insulating layer, applying a solvent capable of dissolving the miscible substance in the binder and yet incapable of dissolving the binder and removing the portion of the photoconductive insulating layer corresponding to those portions wherein the miscible substance has permeated.

3,630,729

ELECTROPHOTOGRAPHIC MULTICOLOR COPY PROCESS EMPLOYING SOLUBILIZABLE DYES

Frederick O. Bach, Villa Park; Leo N. Chapin, Des Plaines; Robert Freed, Lincolnwood, and Thomas J. Cernoch, Chicago, all of Ill., assignors to A. B. Dick Company, Niles, Ill.

Filed June 25, 1969, Ser. No. 836,415
Int. Cl. G03g 13/00;, 9/00
U.S. Cl. 96—1.2 10 Claims

An electrophotographic process and materials for the production of multicolor copies of a multicolor original in which an electrostatic charge is applied to a receptor sheet having a face portion subdivided into photoconductive segments containing sensitizing components in interspersed segments which cover different portions of the visible light spectrum and in which each such segment contains a solubilizable dye color corresponding to the color of the spectrum other than that to which the segment is sensitized and in which the exposed receptor is developed with a toner in which the dye component is soluble in response to toner activation for transfer of dye color from the developed receptor to copy sheets brought into surface contact therewith.

3,630,730

DIFFUSION TRANSFER PROCESSES AND ELEMENTS COMPRISING DYE DEVELOPERS AND BIS-SULFONYL ALKANE SPEED-INCREASING AGENTS

Paul H. Stewart, and Donald W. Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 1, 1970, Ser. No. 42,608
Int. Cl. G03c 7/00, 5/54, 1/48
U.S. Cl. 96—3 33 Claims

Increased print speeds are provided in color diffusion transfer systems by processing in the presence of 1,1 bis-sulfonyl alkane speed increasing agents.

3,630,731

DIFFUSION-TRANSFER PROCESSES AND ELEMENTS COMPRISING COLOR COUPLERS AND BIS-SULFONYL SILVER HALIDE SOLVENTS FOR INCREASED SPEED

Judith A. Schwan, Rochester, and Walter M. Bush, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 1, 1970, Ser. No. 42,607
Int. Cl. G03c 1/48, 5/54, 7/00
U.S. Cl. 96—3 30 Claims

Increased speed is obtained by employing a 1,1 bis-sulfonyl alkane silver halide solvent in a color, diffusion transfer element having at least one nondiffusible coupler capable of reacting with oxidized color developing agent to produce a diffusible dye.

3,630,732

THERMOGRAPHIC RECORDING MATERIAL

Gerard Albert Delzenne, Gravenwezel, and Eric Maria Brinckman, Mortsel, both of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed June 26, 1967, Ser. No. 648,881
Claims priority, application Great Britain, June 24, 1966, 28.555/66
Int. Cl. G03c 5/04
U.S. Cl. 96—27 6 Claims

A photothermographic method of reproducing an original bearing an image of material absorbing visible or infrared radiation and converting the same into heat in which the original is arranged with its image material in heat conductive relation with a recording layer containing a normally solvent soluble material adapted to react with a cross-linking agent and would be thereby rendered less soluble, a compound decomposing when heated to yield a cross-linking agent for said cross-linkable material and uniformly distributed therethrough a finely divided substance absorbing visible or infrared radiation and converting the same to heat,

and while the original and layer are thus arranged one of them is uniformly exposed for a time not in excess of 10^{-2} seconds to light or infrared radiation sufficiently intense to decompose the compound in the areas of the layer corresponding to the nonimage areas of the original whereby such nonimage areas undergo a loss in solubility whereas the image areas remain relatively soluble. Reflectographic exposure with the radiation impinged upon the recording layer is preferred, with the layer containing a sufficient amount of the finely divided material to impart thereto an optical density of 0.2–0.8.

3,630,733

PHOTOGRAPHIC SYSTEMS AND PROCESSES HAVING HEAT ALTERABLE SPECTRAL SENSITIVITY

John R. Manhardt, Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 12, 1968, Ser. No. 697,319
Int. Cl. G03g *5/00, 13/22*
U.S. Cl. 96—27 **32 Claims**

Reproduction systems having broader spectral sensitivity are produced wherein certain classes of dyes are added to photosensitive materials which, when activated, are capable of producing chemical reaction when in contact with image-forming agents to produce a visible image. The dyes are those which undergo a color change when heated to elevated temperatures and thus alter the spectral sensitivity of the photosensitive materials after heating. The dyes include styryl dyes substituted on the vinyl group by a nitrogen-containing heterocyclic, which in their unaltered state, themselves alter the sensitivity of the reproduction system.

Improved processes using this improved reproduction system comprise selectively exposing the present systems to activating radiation after heating to the color transition temperature or alternatively first exposing and then heating to the said temperature. A preferred process is an add-on technique for addition of images to a reproduction system in which readable images are already present. The new reproduction systems of this invention have a built-in differential in spectral sensitivity by virtue of alteration of the dye by heating.

3,630,734

PHOTOGRAPHIC DIFFUSION TRANSFER PRODUCT AND PROCESS

David Alan Cottingham, Northwood, Middlesex, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 12, 1969, Ser. No. 806,738
Int. Cl. G03c *5/54*
U.S. Cl. 96—29 **18 Claims**

A receiving layer for use in the silver salt diffusion transfer process comprises a silver precipitant, 2-methyl hydroquinone, p-N-methylaminophenol, an alkali metal bromide and a silver halide solvent.

A plurality of copies are obtained from a single negative by the silver salt diffusion transfer process by repeatedly contacting an exposed silver halide emulsion layer containing hydroquinone with this receiving layer in the presence of an aqueous alkaline processing solution containing a silver halide solvent.

3,630,735

METHOD FOR FIXING LIGHT-SENSITIVE FREE RADICAL PHOTOGRAPHIC MATERIALS WITH HEAVY METAL SALTS

Kohei Itano; Shoichiro Hoshino, and Akira Kato, all of Tokyo, Japan, assignors to Keuffel & Esser Co., Hoboken, N.J.

Filed Aug. 23, 1967, Ser. No. 662,591
Claims priority, application Japan, Aug. 24, 1966, 41/55418
Int. Cl. G03c *5/24, 1/72*
U.S. Cl. 96—48 **4 Claims**

Images formed in free radical photosensitive materials comprising organic halogen-containing photoactivators capable of generating halogen free radicals upon exposure to light are fixed by treatment with aqueous solutions of reducing heavy metal salts.

3,630,736

LEUCO DYE/HEXAARYLBIIMIDAZOLE COMPOSITIONS AND PROCESSES

Lawrence Anthony Cescon, and Rolf Dessauer, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 728,781, May 31, 1968, now Patent No. 3,445,234, which is a continuation-in-part of application Ser. No. 426,421, Jan. 18, 1965, now abandoned , which is a continuation-in-part of application Ser. No. 234,538, Oct. 31, 1962, now abandoned. This application May 19, 1969, Ser. No. 826,009
Int. Cl. G03c *5/24*
U.S. Cl. 96—48 **17 Claims**

Process for deactivating selected photosensitive, color-forming compositions against color formation by removing solvent from the compositions until they are substantially dry, and maintaining such dry compositions at a temperature below the activation temperature of the compositions; especially compositions comprising an admixture of selected hexaarylblimidazoles and selected leuco dyes dispersed in a thermoplastic binder.

3,630,737

PHOTOGRAPHIC STABILIZER BATH COMPRISING THIOCYANATE AND AN INORGANIC HARDENER COMPLEX

Wilhelm Kairies, Leverkusen, and Kurt Faber, Cologne, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft Leverkusen, Germany

Filed Apr. 6, 1970, Ser. No. 26,054
Claims priority, application Germany, Apr. 23, 1969, P 19 20 501.7
Int. Cl. G03c *5/38, 1/30*
U.S. Cl. 96—61 **5 Claims**

Photographic images are produced by imagewise exposure of supported silver halide emulsion layers, development and treatment with a stabilizing bath to convert the light-sensitive silver salt in the unexposed and undeveloped areas into light-insensitive reaction products. The stabilizing bath contains as inorganic hardeners complex compounds of zirconium, aluminum and chromium.

3,630,738

BRIGHTENING AGENTS

Kenneth M. Dear, Luton, Bedfordshire; Roy A. Jeffreys, and David A. Thomas, both of Hatch End, Middlesex, all of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1969, Ser. No. 827,154
Int. Cl. G03c *1/92, 1/84*
U.S. Cl. 96—82 **8 Claims**

Thiazolo(5,4-d)thiazoles substituted with polycyclic aromatic groups or heterocyclic groups either directly onto the 2- and 5-positions or onto the 2- and 5-positions through conjugated linking groups, are valuable brightening agents for use in photographic elements or in polymeric materials.

3,630,739

ANTI-HALATION LAYER COMPRISING GELATIN, TETRAVOLENT MANGANESE, AND WATER-SOLUBLE POLYMERIC HYDROLYZATE

Philip Hine, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company

Filed May 1, 1969, Ser. No. 821,109
Int. Cl. G03c *1/84*
U.S. Cl. 96—84 **11 Claims**

An aqueous, colored, stable liquid containing tetravalent manganese and a water-soluble addition polymer hydrolyzate

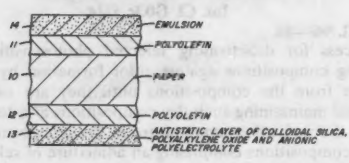
prepared by the reduction of potassium permanganate in aqueous media containing a water-soluble addition polymer hydrolyzate, and a photosensitive element containing a light-absorbing layer prepared from the liquid.

3,630,740

ANTISTATIC LAYERS FOR POLYMERIC PHOTOGRAPHIC SUPPORTS

Douglas C. Joseph, Victor; William C. Kerr, Middlesex, and Harold K. Reed, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 24, 1969, Ser. No. 869,086
Int. Cl. G03c *1/82, 1/86*
U.S. Cl. 96—85 **7 Claims**



Photographic elements having polyolefin supports coated with silver halide emulsions highly sensitive to static discharges, are protected against static by coating a polyolefin surface with a mixture of a polyelectrolyte, a polyalkylene oxide and colloidal silica. The static protection obtained is substantially better then obtained by coating the polyolefin surface with any one or two of the three materials.

3,630,741

ADHESIVE GELATIN-TERPOLYMER MATERIALS HAVING AT LEAST ONE CONJUGATED VINYLENE DICARBONYL COMPOUND ADDED TO THE EMULSION POLYMERIZATION REACTION MIXTURE

Jacques Vial, Sarcelles, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 12, 1969, Ser. No. 857,585
Claims priority, application France, Dec. 31, 1968, 182377
Int. Cl. G03c *1/80*
U.S. Cl. 96—87 **10 Claims**

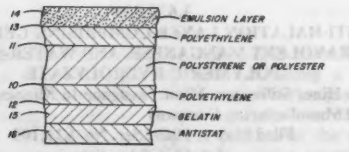
The introduction of at least one conjugated vinylene dicarbonyl compound into an emulsion polymerization reaction mixture comprising water, monomers and gelatin used to produce gelatin-terpolymer compositions useful as subbing layers for photographic films provides a subbing material having substantially improved adhesive characteristics.

3,630,742

POLYMERIC PHOTOGRAPHIC SUPPORTS

Irvin H. Crawford, Spencerport, and James L. Kane, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 16, 1969, Ser. No. 866,983
Int. Cl. G03c *1/82, 1/78*
U.S. Cl. 96—87 R **16 Claims**



A photographic element having a translucent support is prepared by activating each surface of a sheet of polystyrene or polyester with corona discharge, polyethylene is extruded onto each activated surface, one polyethylene surface is then activated with corona discharge, a gelatin layer is coated upon the activated polyethylene surface and an antistatic layer is coated upon the gelatin layer, the other polyethylene surface is activated by corona discharge and a photosensitive layer such as gelatin-silver halide emulsion layer is coated on the polyethylene surface. Substantial improvement in antistatic properties and curl is obtained compared to coating a single gelatin-containing antistatic layer on the polyethylene surface.

3,630,743

METHOD OF IMPROVING THE PHOTOSENSITIVITY OF METAL OXIDE SEMICONDUCTORS

Martin L. Harvill, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Feb. 16, 1968, Ser. No. 706,186
Int. Cl. G03g *5/02;* **G03c** *1/72*
U.S. Cl. 96—88 **23 Claims**

This disclosure relates to a process of improving the photoconductivity of metal-containing semiconductors by heating the semiconductor at elevated temperatures and rapidly quenching the heated semiconductor. Particularly, the semiconductor is heated in an atmosphere which reversibly alters the stoichiometry of the semiconductor and then rapidly quenched in the atmosphere. The major improvement in the semiconductor lies in a substantial increase in the photographic speed of media comprising the semiconductor when exposed to activating radiation.

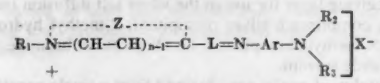
3,630,744

SELECTIVELY DESENSITIZED SILVER HALIDE EMULSION MATERIALS

Robrecht Julius Thiers, Brasschaat; Theofiel Hubert Ghys, Kontich, and Henri Depoorter, Mortsel, all of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed May 31, 1967, Ser. No. 642,355
Claims priority, application Great Britain, July 1, 1966, 29,579/66
Int. Cl. G03c *1/36*
U.S. Cl. 96—101 **4 Claims**

A photographic material containing a silver halide emulsion layer for recording information in the form of very short wavelength invisible electromagnetic radiation known as X-ray, wherein the sensitivity of said layer for ultra violet light and visible light is strongly reduced without substantially affecting the X-ray sensitivity of said material by incorporating therein an appropriate amount of a selective densitizing compound according to the following general formula



wherein:

R_1 represents an alkyl group, an unsaturated aliphatic group, or an aryl group,

Z represents a heterocyclic nucleus of the thiazole series, benzothiazole series, naphthothiazole series, thiadiazole series, oxazole series, benzoxazole series, naphthoxazole series, selenazole series, benzoselenazole series, naphthoselenazole series, 2-quinoline series, pyrimidine series, quinoxaline series, quinazoline series, 1-phthalazine series, thionaphtheno [7,6-d]thiazole series, 2-pyridine series, and benzimidazole series,

L represents a methine radical,

Ar represents a bivalent aromatic radical,

n represents 1 or 2,

X^- represents an anion, but is not present when R_1 itself contains an anionic group, and

each of R_2 and R_3 represents alkyl, aryl, or R_2 and R_3 together represent the atoms necessary to close a heterocyclic nucleus is described.

3,630,745

THIAZOLO [5,4-C]ISOQUINOLINE AND THIAZOLO [4,5-C]IOSQUINOLINE AND DERIVATIVES AS ANTIFOGGANTS FOR PHOTOGRAPHIC LAYERS

Dorothy J. Beavers, and Norman W. Kalenda, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 8, 1969, Ser. No. 864,887
Int. Cl. C07d *35/34, 91/42*; G03c *1/34*
U.S. Cl. 96—109 11 Claims

Thiazolo [5,4-c]isoquinoline and thiazolo [4,5-c]isoquinoline and their derivatives are used in silver halide elements and emulsions in order to stabilize said elements and emulsions against fog.

3,630,746

PHOTOPOLYMERIZABLE RESIN COMPOSITIONS AND WATER-WASHABLE PHOTOPOLYMER PRINTING PLATES

Yasuyuki Takimoto, Takatsuki-shi; Toshikazu Yoshikawa, Amagasaki-shi; Kiyomi Sakurai, Suita-shi; Yasusi Umeda, Osaka; Yoshiaki Oyabu, Kyoto, and Takahiro Tsunoda, Funabashi-shi all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jan. 14, 1969, Ser. No. 791,189
Claims priority, application Japan, Jan. 22, 1968, 43/3238
Int. Cl. G03c *1/68*
U.S. Cl. 96—115 10 Claims

A novel photopolymerizable resin composition consists of (1) 1.26 to 3.78 parts by weight of a monoester of a polyhydric aliphatic alcohol with acrylic or methacrylic acid, (2) as a polymeric binder, an aqueous solution of one part by weight of a partially hydrolyzed polyvinyl acetate having a hydrolysis degree of 95 to 60 mol percent and an average polymerization degree of 300 to 2,000 or one part by weight of a methyl cellulose of an average polymerization degree of 160 having a hydroxylpropoxyl substituent and (3) as a photopolymerization initiator, 1 to 5 percent by weight, based on the total weight of the resin components of the above (1) and (2) constituents, of at least one uranyl salt and 0.0072 to 0.72 percent by weight, on the same basis, of azobisisobutyronitrile. A presensitized plate prepared by coating a metal plate with said photopolymerizable resin composition in a thickness of an order of microns is water washable and can be used to form a relief image. Further, a sheet of said photopolymerizable resin composition having a thickness of 0.1 to 3 mm. is directly used in printing and is water washable when it is exposed to actinic light in contact with a screen negative.

3,630,747

PROCESSING OF BRAZIL NUTS

George L. Lowe, Chicago, and Clarence E. Brucker, Oak Park, both of Ill., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 14, 1968, Ser. No. 775,936
Int. Cl. A23l *1/36*
U.S. Cl. 99—126 5 Claims

A double immersion process for preparing Brazil nuts for use in the manufacture of confections is described which results in reducing the micro-organisms present on the Brazil nuts, while simultaneously cleaning them and improving their appearance and organoleptic properties. The double immersion process consists of, first, immersing the Brazil nuts in water at a temperature of 200° to 212° Fahrenheit for about 1½ to 2 minutes and then immersing the Brazil nuts in a stream of heated air at a temperature of about 200° to 220° F. for about 2 to 10 minutes.

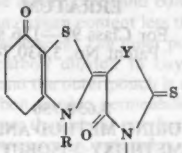
3,630,748

SPECTRALLY SENSITIZED LIGHT-SENSITIVE SILVER HALIDE MATERIAL

Johannes Gotze, Bergisch-Neukirchen; Karl Lehmer, and Erich Bockly, both of Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 1, 1970, Ser. No. 24,812
Claims priority, application Germany, Apr. 3, 1969, P 19 17 163.2
Int. Cl. G03c *1/08*
U.S. Cl. 96—139 2 Claims

Light-sensitive photographic silver halide material is spectrally sensitized in the blue or blue-green range of the spectrum by new sensitizing dyes of the formula



wherein
Y stands for O,S,N-aryl or N-alkyl;
R stands for alkyl, and
R′ stands for alkyl, cycloalkyl, aryl or aralkyl which groups are preferably substituted with acid groups.

The new compounds exhibit no "Schwarzschild effect" and are useful sensitizers for color photographic silver halide emulsions.

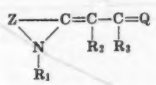
3,630,749

SILVER HALIDE EMULSIONS SENSITIZED WITH MEROCYANINE DYES CONTAINING A THIOUREIDO GROUP

Frank G. Webster, and Leslie G. S. Brooker, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

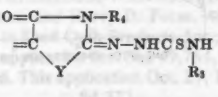
Filed Mar. 19, 1970, Ser. No. 21,210
Int. Cl. G03c *1/08*
U.S. Cl. 96—140 13 Claims

A novel class of dyes especially useful as sensitizers for photographic silver halide emulsions and electrographic coatings of zinc oxide having the following structure:



wherein Z represents the atoms required to form a basic heterocyclic nucleus; R_1 is an alkyl or aryl radical; R_2 and R_3 are selected from the group consisting of a hydrogen atom, lower alkyl radical or aryl radical and Q is a radical selected from:

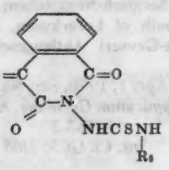
(a)



wherein R_4 is selected from the group consisting of a hydrogen atom, an alkyl radical or an aryl radical and Y is selected from the group consisting of an oxygen atom, a sul-

fur atom or a selenium atom and R_3 is selected from the group consisting of a hydrogen atom, an alkyl atom or an aryl atom; or

(b)



wherein R_6 has the same designated value as R_5.

ERRATUM

For Class 99—126 see:
Patent No. 3,630,747

3,630,750

FOOD-FLAVORING METHOD AND COMPOSITION USING 2-METHOXY-3-ISOBUTYLPYRAZINE

Ron G. Buttery, Richmond; Richard M. Seifert, El Cerrito; Robert E. Lundin, Berkeley, and Dante G. Guadagni, Moraga, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Apr. 18, 1969, Ser. No. 818,471
Int. Cl. A23l *1/22*; C07d *51/76*
U.S. Cl. 99—140 R 16 Claims

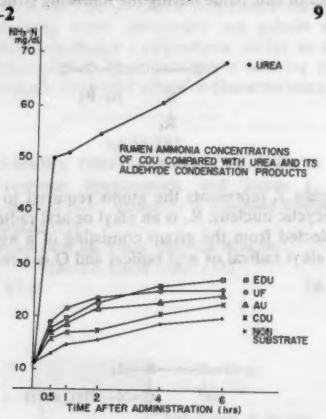
Leucine amide is reacted with glyoxal to produce 2-hydroxy-3-isobutylpyrazine, and this intermediate is methylated to yield the new compound 2-methoxy-3-isobutylpyrazine. This compound exhibits an intense aroma of freshly chopped green bell peppers, and is useful for flavoring food products.

3,630,751

FEED FOR RUMINANTS INCORPORATING 2-OXS-4-METHYL-6-UREIDOHEXAHYDROPYRIMIDINE

Tsunezo Ushioda, and Tatsuo Koyanagi, both of Tokyo, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of application Ser. No. 607,397, Jan. 5, 1967, now abandoned. This application Mar. 4, 1970, Ser. No. 16,457
Int. Cl. A23k *1/00*
U.S. Cl. 99—2 9 Claims



A feed for ruminants in which 2-oxo-4-methyl-6-ureidohexahydropyrimidine, a condensation product of urea and acetaldehyde or crotonaldehyde is incorporated, as a substitute for one part of the protein in said feed.

3,630,752

NITRATE ADDITION TO INHIBIT CORROSIVE ACTION OF AMMONIATED SUPERPHOSPHORIC ACID

Herbert F. Scott, Jr., Prince George, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 25, 1969, Ser. No. 861,144
Int. Cl. A23k *1/00*; C23f *11/00*; C05b *7/00*
U.S. Cl. 99—2 13 Claims

Ferrous and aluminum metal corrosion by an aqueous solution of ammoniated superphosphoric acid is inhibited by incorporating about 0.5–5 percent by weight of nitrate ion based on the total phosphorous content measured as P_2O_5. The aqueous solution, which is useful as a ruminant feed supplement, has a pH of 5–8, a nitrogen content of 9–12 percent by weight, and a total phosphorous content measured as P_2O_5 of 28–39 percent by weight.

3,630,753

METHOD OF PRODUCING AN EDIBLE SOY PROTEIN HAVING REDUCED VISCOSITY

Paul Melnychyn, Northridge, and John M. Wolcott, Burbank, both of Calif., assignors to Carnation Company, Los Angeles, Calif.

Filed July 2, 1968, Ser. No. 741,866
Int. Cl. A23j *1/14*
U.S. Cl. 99—17 19 Claims

The present invention relates to a method of controllably decreasing the viscosity of soy protein in aqueous dispersion. The method includes treating soy protein in the dispersion with a selected treating agent at selected temperature and for a time sufficient to effect a desired viscosity reduction without substantial hydrolysis of the soy protein. Thereafter, the protein is separated from the treating agent. Such treating agent may comprise any one or more of such agents as halogens, inorganic salts containing both halogen and oxygen atoms, soluble inorganic persulfates, azodiamides, thiol-containing reducing agents. As one embodiment of the invention, soy protein after treatment with the treating agent is contacted with an odor-and-flavor-improving agent selected from the group consisting of aliphatic mono- and polyhydroxy alcohols, ethers and ketones and mixtures thereof for a time and at a temperature and concentration sufficient to improve substantially the odor and flavor thereof. Such contact is effected by first precipitating the soy protein at about its isoelectric point, i.e., about pH 4.5 and then washing the precipitate with the improving agent. In another embodiment an aqueous dispersion containing the treated soy protein is mixed with the improving agent.

3,630,754

MILLING OF CEREAL GRAINS AND PROCESSING OF PRODUCTS DERIVED THEREFROM

Truman Benjamin Wayne, P.O. Box 13086, Houston, Tex.

Filed May 7, 1969, Ser. No. 822,641
Int. Cl. A23l *1/10*
U.S. Cl. 99—80 PS 8 Claims

This invention relates to improvements in milling and processing cereal grains and has, as its primary objective, the separation and recovery of the fibrous, proteinaceous and starchy components of said cereal grains in more concentrated, purer states. The improved results are obtained by separating and removing the major portion of the fibrous components from the system as early as possible in the overall process so that the separating section, in which the final separation between said fibrous, proteinaceous and starchy components occurs, is not overloaded by the fibrous components and can, therefore, operate more efficiently.

3,630,755

DOUGH PROOFING METHOD

Robert F. Schiffmann, Brooklyn; Ernest W. Stein, New York, and Harold B. Kaufman, Jr., New York, all of N.Y., assignors to DCA Food Industries, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 649,610, June 28, 1967, now abandoned. This application July 1, 1970, Ser. No. 51,458

Int. Cl. A21d *8/02*

U.S. Cl. 99—90 R 30 Claims

A method for proofing cut pieces of yeast-containing dough. The dough pieces are subjected to at least two microwave heating periods separated by a "rest" period. Typically, the dough pieces are first heated for a period of 5 to 180 seconds to raise the dough temperature to between 90° and 120° F. Heating of the dough pieces is then stopped for 20–180 seconds to permit temperature equilibration. Thereafter, the dough pieces are heated again for a period not exceeding 3 minutes to a temperature between 100° and 130° F. During both heating intervals, the power density within the dough pieces is in the range 0.089–9.7 watts/g. Such a sequence allows the dough pieces to uniformly rise to an optimum volume in a relatively short time.

3,630,756

VINEGAR-TYPE FLAVOR COMPOSITION

Ross Alexander Smith, 7 Orme Ct., London, W. 2., and John Alexander Francis Woods, 24 Dennington Park Road, Kilburn, N.W. 6., London, both of England (formerly of 28 Collington Ave., Bexhill-on-Sea, Sussex, England)

Filed Mar. 18, 1970, Ser. No. 20,840

Int. Cl. A23l *1/26*

U.S. Cl. 99—140 R 8 Claims

A solid flavor composition of vinegar-type is provided by absorbing a still residue resulting from the distillation of vinegar from a double fermentation vinegar liquor (hitherto believed to be of no commercial value) in a nontoxic substantially water-insoluble substrate, preferably amorphous silica gel. The composition finds use in powdered comestible products akin to tomato or Worcester sauce.

3,630,757

METHOD OF MAKING SIMULATED TOMATO PRODUCTS WITH MUSTARD SEED HULLS

Charles E. Meid, Arlington Heights, Ill., assignor to Kraftco Corporation

Continuation-in-part of application Ser. No. 732,516, May 28, 1968, now abandoned. This application Apr. 1, 1969, Ser. No. 813,811

Int. Cl. A23l *1/22*

U.S. Cl. 99—144 3 Claims

A composition is provided containing substantially no tomato solids which is similar to the body and consistency of products prepared from tomatoes. The composition comprises a bodying agent which is used for establishing body and consistency and may comprise a gum or starch material. The bodying agent is mustard seed hulls.

3,630,758

FRUIT HARVESTING TECHNIQUE

Charles C. Despain, Oroville, Wash., assignor to Hemisphere Harvesters, Inc., Oroville, Wash.

Filed Nov. 19, 1968, Ser. No. 777,148

Int. Cl. A23b *7/00*

U.S. Cl. 99—168 3 Claims

The method of harvesting apples comprising coating the apples in situ on the tree with a cushioning material, preferably a polymer froth foam, such as a mixture of hydrolyzed polyvinyl alcohol, polyvinyl alcohol, water, and trichloromonofluoromethane (Freon 11), shaking the trees to release the apples from the tree, and collecting the apples with the cushioning material still intact. In addition, the foam may remain on the apples during handling and storage to reduce bruise damage during processing after harvesting.

3,630,759

PACKAGE FOR RESPIRATORY PRODUCTS

George G. Rumberger, Portage, Mich., assignor to Brown Company, Kalamazoo, Mich.

Continuation-in-part of application Ser. No. 499,088, Oct. 20, 1965, now abandoned. This application Jan. 2, 1970, Ser. No. 376

Int. Cl. B65b *25/04, 31/00*

U.S. Cl. 99—171 LP 14 Claims

Perishable plant foods are contained in a package comprising an inner pouch containing the plant food and an outer pouch enveloping the inner pouch and containing a gaseous atmosphere having an oxygen content less than about 15 percent by volume therebetween. The inner pouch is made of a material having a carbon dioxide to oxygen permeability ratio of at least 3:1, and the outer pouch is made of a material having both a carbon dioxide permeability and an oxygen permeability no greater than about one-fourth of the oxygen permeability of the inner pouch material.

3,630,760

METHOD OF PREPARING COLLAGEN SAUSAGE-CASING TUBING

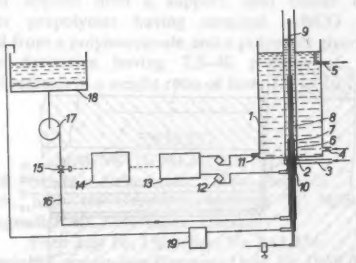
Kenneth William Taylor, Higham Ferrers, England, assignor to Lever Brothers Company, New York, N.Y.

Filed May 5, 1969, Ser. No. 821,753

Claims priority, application Great Britain, May 6, 1968, 21,291/68

Int. Cl. A22c *13/00*

U.S. Cl. 99—176 7 Claims



The diameter of collagen tubing prepared by extrusion into a setting bath is controlled by monitoring and maintaining substantially constant a pressure difference between the setting solution at a position inside the tubing being extruded and the setting solution in the bath outside the tubing.

3,630,761

FOOD FRESHENER-WARMING DEVICE

Davis Piper, Tipton, and Harry D. Forse, Anderson, both of Ind., assignors to Food Quik Products, Inc., Anderson, Ind.

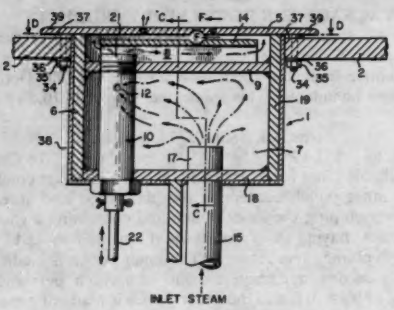
Continuation of application Ser. No. 49,764, June 25, 1970, now abandoned. This application Oct. 27, 1970, Ser. No. 84,373

Int. Cl. A21d *15/00*

U.S. Cl. 99—234 R 11 Claims

Apparatus wherein steam is continuously circulated through a steam reservoir chamber in the device, which keeps it and an attached second chamber and head portion

hot. Steam passing via an operator controlled valve from the reservoir chamber to the second chamber is dried, and the



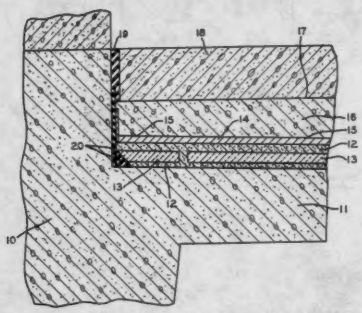
dry steam escapes through spaced orifices in a head portion to warm and freshen food items placed thereon.

3,630,762

WATERPROOFING BARRIER

Robert N. Olton, Cleveland Heights, Ohio, and Bernard C. Berney, Indianapolis, Ind., assignors to Mineral Products Corporation, Cleveland Heights, Ohio

Filed Dec. 29, 1969, Ser. No. 888,235
Int. Cl. C09k *3/00*
U.S. Cl. 106—2 9 Claims



A waterproofing barrier characterized by its controlled swelling when wet and comprising in admixture a water-swellable colloidal clay, such as bentonite, and a particulate, inorganic metal salt treated with an oleaginous carboxylic acid. Preferably, the metal salt is calcium carbonate, such as amorphous chalk, treated with an acid like oleic or stearic acids. The mixture is particularly adapted as a protective layer in a below grade concrete roof system, or the like, above which is a pavement, earth, walks, etc., are to be laid. The present mixture may be used alone as in layer form or in conjunction with an adjoining layer of water-swellable clay to form a multilayer barrier. Optionally, the mixture may include a finely divided siliceous mineral such as perlite as an additional ingredient.

3,630,763

CONTROL OF TRANSIT STAIN ON WOOD PRODUCTS

William C. Kelso, Jr.; Clayborne M. Connor, II; Oscar U. Walling, all of Memphis, Tenn., and A. Dale Chapman, Atherton, Calif., assignors to Chapman Chemical Company, Memphis, Tenn.

Filed Mar. 21, 1969, Ser. No. 809,250
Int. Cl. C09d *5/08*
U.S. Cl. 106—14 1 Claim

The treatment of wood to greatly reduce the in-transit iron staining of same when shipped in commerce by applying thereto prior to shipment an antistatic agent (preferably anionic), or a chemical change inhibitant for iron (preferably a chelating agent for iron), or such antistatic agent in combination with the chemical change inhibitant for iron.

3,630,764

FIRE-RESISTANT PAINT

Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation

Continuation-in-part of application Ser. No. 583,064, Sept. 9, 1966, now abandoned, continuation-in-part of application Ser. No. 378,216, June 26, 1964, now abandoned, which is a Continuation-in-part of application Ser. No. 132,827, Aug. 21, 1961, now abandoned. This application Jan. 8, 1969, Ser. No. 789,945
Int. Cl. C09d *5/18*
U.S. Cl. 106—15 5 Claims

A fire-resistant paint comprising a paint vehicle having uniformly dispersed throughout a powdered glass and a powdered blowing agent for the glass. Films of the paint not only provide a normal protective and decorative function, but remain in position when exposed to temperatures above the softening point of the glass to be transformed into a layer of foamed glass which thereafter acts as a heat insulation.

3,630,765

PHOTOCHROMIC GLASS CONTAINING TANTALUM OXIDE FOR OPTICAL FIBER FABRICATION

Roger J. Araujo, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 24, 1969, Ser. No. 801,562
Int. Cl. C03c *3/04*
U.S. Cl. 106—54 3 Claims

This invention relates to photochromic glass compositions containing about 10–50 percent by weight Ta_2O_5 which have refractive indices higher than about 1.52, and, preferably, higher than about 1.58, thereby rendering them especially suitable as a core glass in the production of photochromic optical fibers.

3,630,766

REFRACTORY FIBERS AND METHOD OF PRODUCING SAME

James Economy, Eggertsville, and Vlado I. Matkovich, Williamsville, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Nov. 25, 1969, Ser. No. 879,932
Int. Cl. C04b *35/58*
U.S. Cl. 106—55 10 Claims

Boron nitride fibers having a maximum diameter of about 10 microns are heated at a temperature of at least about 1,100° C. in a gaseous atmosphere consisting essentially of hydrogen and a halide of a transition metal selected from the group consisting of titanium, niobium, zirconium, tantalum and hafnium. The fibers are thereby converted to refractory fibers which consist essentially of the corresponding transition metal nitride and from about 2 percent to about 10 percent boron.

3,630,767

PROCESS FOR PROVIDING CONTACTS ON A SEMICONDUCTOR BODY

Hans Linstedt, Stuttgart, and Siegfried Bellon, Eltingen, both of Germany, assignors to Robert Bosch, GmbH, Stuttgart, Germany

Filed Nov. 26, 1969, Ser. No. 880,384
Claims priority, application Germany, Nov. 30, 1968, P 18 11 928.3
Int. Cl. B44d *1/18*
U.S. Cl. 117—227 6 Claims

Contacts on a semiconductor body are formed by depositing a nickel coating through reduction of a nickel salt with sodium hypophosphite, followed by treating the semiconductor with a solvent for elemental yellow phosphorus to remove phosphorus from the contact area.

3,630,768

CHEMICAL DEPOSITION FORMATION OF ANODES

Giuseppe Bianchi, and Antonio Nidola, both of Milan, Italy, assignors to Electronor Corporation, Chiasso, Switzerland

Filed June 28, 1966, Ser. No. 561,054
Int. Cl. B01k *3/04*; C23c *3/02, 3/04*
U.S. Cl. 117—227 7 Claims

Compositions and method for chemical deposition of platinum group metals on a base structure and to novel electrodes produced by the said method. The invention relates particularly, but not exclusively, to electrodes for use in the electrolysis of salt solutions.

3,630,769

PRODUCTION OF VAPOR-DEPOSITED NB B SN CONDUCTOR MATERIAL

Peter B. Hart; Christopher Hill, and Clifford W. Wilkins, all of Ilford, Essex, England, assignors to The Plessey Company Limited, Ilford, Essex, England

Filed Apr. 18, 1969, Ser. No. 817,573
Claims priority, application Great Britain, Apr. 24, 1968, 19,317/68
Int. Cl. C23c *11/00, 11/08*
U.S. Cl. 117—227 6 Claims

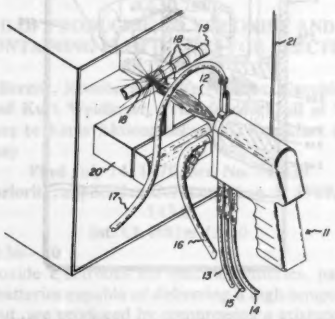
Nb_3Sn superconductor material of increased critical current density is obtained by carrying out vapor deposition by decomposition of chlorides on a heated corrosion-resistant substrate in the presence of oxygen, for example 0.5 percent oxygen, in a mixed hydrogen and argon gas stream.

3,630,770

METHOD FOR FABRICATING LANTHANUM BORIDE CATHODES

Louis J. Favreau, Elnora, N.Y., assignor to General Electric Company

Filed Apr. 30, 1969, Ser. No. 820,565
Int. Cl. B44d *1/18*; H01j *1/14, 19/06*
U.S. Cl. 117—230 6 Claims



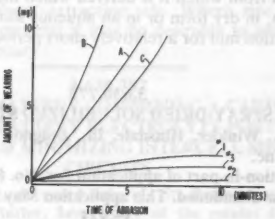
A method for fabricating cathodes with a lanthanum boride coating is disclosed in which the coating is applied to any base metal by spraying with a plasma flame spray. One plasma source is a spray gun utilizing an electric arc discharge through which a plasma gas is passed so that a plasma of ionized gas issues from the spray gun into which is injected a carrier gas having lanthanum boride powder suspended therein. The high-temperature plasma flame appearing at the nozzle of the spray gun melts the lanthanum boride (LaB_6) almost instantly and the droplets formed thereby are carried to the surface of a prepared base material.

3,630,771

MAGNETIC RECORDING MEDIUM

Goro Akashi, Janagawa; Yasuyuki Yamada, and Masaaki Fujiyama, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sept. 6, 1968, Ser. No. 757,967
Claims priority, application Japan, Sept. 8, 1967, 42/57639
Int. Cl. H01f *10/02*
U.S. Cl. 117—235 4 Claims



A magnetic recording medium wherein a magnetic recording layer is formed from a ferromagnetic powder dispersed in a binder applied onto a support, said binder being a polyether prepolymer having terminal —NCO radicals prepared from a polyisocyanate and a polyether glycol with a cellulose derivative having 7.5–40 percent of residual hydroxyl radicals in a weight ratio of from 1:2 to 20:1.

3,630,772

MAGNETIC MEMORY FILM

Bernhard Seidel, Gruenwald; Hans-Heinrich Credner, Munich, both of, Germany, assignor to Agfa-Fevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 16, 1969, Ser. No. 842,336
Claims priority, application Germany, July 20, 1968, P 17 74 584.5
Int. Cl. H01f *10/02*
U.S. Cl. 117—235 9 Claims

A lubricant is incorporated in the coating of a magnetic memory film which contains a neutral ester of a 2–20 carbon dicarboxylic acid with an aliphatic, monofunctional alcohol having 4–18 carbon atoms.

The lubricant increases the stability of still pictures recorded on the film, in particular in case of scanning with mumetal heads.

3,630,773

CONTINUOUS PROCESS FOR THE EXTRACTION OF STARCH MATERIALS AND PRODUCTS PRODUCED THEREBY

Thomas J. Schoch, deceased, late of La Grange, Ill. (by Lydia W. Schoch, executrix), assignor to CPC International Inc.

Filed Apr. 4, 1968, Ser. No. 718,922
Int. Cl. C13l *1/08*
U.S. Cl. 127—32 13 Claims

Process for the removal from a starch material of substances that are soluble in a hydrophilic fat solvent. One particular kind of substance that can be removed is the normal bound fat. The process involves rapidly heating the granular starch material in intimate contact with an aqueous vehicle

comprising a hydrophilic organic fat solvent in a confined treating zone, to a temperature up to about 300° F. and preferably from about 170° to about 260° F., under a pressure that maintains the vehicle essentially in the liquid phase, during a time period at the elevated temperature from about 30 seconds to not more than about 10 minutes, then promptly separating the aqueous vehicle from the extracted starch material. The products have superior gel-forming characteristics and are particularly useful in the manufacture of gum confections, puddings, aspics, and the like.

3,630,774

DISRUPTED GRANULAR STARCH PRODUCTS AND METHODS OF MAKING THEM

James W. Knight, Wilmslow, England, assignor to Corn Products Company

Filed Aug. 14, 1968, Ser. No. 752,532
Int. Cl. C13l *1/08*
U.S. Cl. 127—32 **16 Claims**

Process for making a granular starch product exhibiting a lower gelatinization temperature and a higher reactivity than the starch from which it is derived which includes subjecting the starch, in dry form or in an aqueous slurry, to the action of a vibration mill for a relatively short period of time.

3,630,775

SPRAY-DRIED SOLUBILIZED STARCH

August A. Winkler, Hinsdale, Ill., assignor to CPC International Inc.

Continuation-in-part of application Ser. No. 699,340, Jan. 22, 1968, now abandoned. This application May 8, 1970, Ser. No. 35,921
Int. Cl. C13l *1/08*
U.S. Cl. 127—71 **4 Claims**

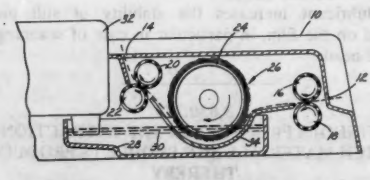
Unmodified, ungelatinized starch is slurried in water at a solids content between about 10 percent and about 40 percent by weight, elevated to a high temperature under pressure, the temperature being in excess of about 325° F., and while under pressure, the starch is spray-dried to a moisture content less than 15 percent. The resulting product has an extremely high-water solubility generally in excess of 80 percent.

3,630,776

METHOD AND APPARATUS FOR CLEANING SELECTIVELY FUSED MASTER

Frederick E. Barr, Chesterland, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Dec. 8, 1969, Ser. No. 883,012
Int. Cl. B08b *1/02*; **G03g** *15/00*
U.S. Cl. 134—9 **8 Claims**



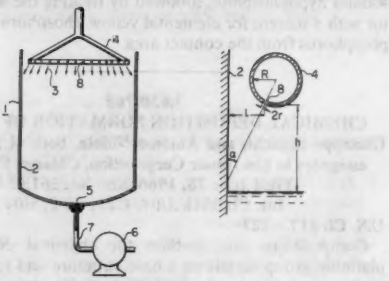
A roller having a relatively long napped loose-woven limp fabric on the surface thereof is rotated against the surface of a selectively fused electrostatic master to remove unwanted partially fused specks of material. The roller is rotated partially submerged in a liquid into which the removed material is deposited.

3,630,777

METHOD OF CLEANING EQUIPMENT FOR SUPPLYING LIQUID

Kazutomo Ishizawa, Osaka-shi, Osaka; Tetsujiro Kubota, Yokkaichi-shi; Jiro Miki, Higashiosaka-shi, Osaka; Hirotsugu Matsunaga, Yokkaichi-shi, and Sadao Otake, Kobe-shi, all of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1969, Ser. No. 816,312
Claims priority, application Japan, Sept. 24, 1968, 43/68522
Int. Cl. B08b *9/08, 3/02*
U.S. Cl. 134—22 R **4 Claims**



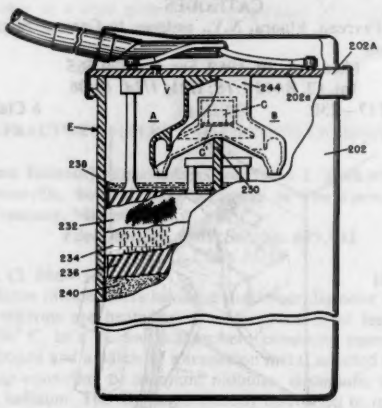
An improved cleaning method for liquid supplying equipment composed of a vertical tank and a liquid transportation means, in which the inside wall surface of the tank is cleaned by cleaning liquid flows covering the whole wall surface to be cleaned, and the cleaning liquid supplied into the tank is discharged at the same flow rate as the supply flow rate. At the same time, the sealing means of the liquid transportation means is cleaned by fresh cleaning liquid.

3,630,778

METHODS AND MEANS FOR RECOMBINING HYDROGEN AND OXYGEN IN A SEALED BATTERY AND CONTROLLING RECOMBINATION AT CATALYST SURFACES

Ekkehard L. Kreidl, Wayland, and Douglas Shooter, Winchester, both of Mass., assignors to Koehler Manufacturing Company, Marlboro, Mass.

Filed Oct. 15, 1969, Ser. No. 866,531
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 **8 Claims**



Hydrogen and oxygen gases are safely recombined in the presence of a catalytic device which operates in two stages in

a secondary battery system. Recombination continues in a controlled manner while the battery is on discharge and charge for periods corresponding to the normal life of a conventional secondary battery. In sealed secondary battery systems hydrogen and oxygen gases evolved during operation of the battery are releasably contained through a range of pressures during which long term stoichiometric recombination of the gases takes place.

The catalytic device in a preferred form comprises a foraminous body which includes exposed catalytic surfaces of relatively low gas recombining capacity and an inner nucleus of enclosed catalytic material. The nucleus comprises enclosed catalytic surfaces on which gases passing through the foraminous body react initially within a thermally favorable environment whereby cumulative heating can take place. A resulting buildup of heat at the nucleus is released to raise the temperature of the exposed catalytic surfaces to temperatures at which gases coming into contact with the exposed catalytic surfaces will start to recombine thereon, and continue to react in a sustained manner within a limited temperature range. When, as may occur, the exposed catalyst surfaces are subjected to increasing gas pressure in the battery they become self-limiting in the extent to which their temperature may be raised by exothermic reaction.

Thus the rate of recombination of gases at catalyst surfaces is controlled and limited to positively prevent the exposed catalyst surfaces from reaching temperatures at which an explosion may take place, i.e., temperatures found to be within upper limits of from about 400° up to about 600° C., and the range of control may be extended downwardly to values as low as 250° C. for some battery operations. Water resulting from the controlled recombination at the catalyst surface is returned to the electrolyte with catalyst surfaces being maintained in a constantly reactive condition.

3,630,779

METHOD OF MAKING A CATHODE FOR USE IN A GALVANIC CELL

Morris Eisenberg, Palo Alto, Calif., assignor to Elca Battery Company, Sunnyvale, Calif.

Filed Apr. 22, 1970, Ser. No. 31,021
Int. Cl. H01m *35/18*
U.S. Cl. 136—20 **2 Claims**

A galvanic cell is disclosed having a cathode comprising a mercury compound to provide active cathodic electrochemical action during cell operation and conductive powders mixed with the mercury compound to provide mass electrical conductivity through the cathode during cathodic electrochemical action. The conductive powders are coated with mercury in constructing the cathode in order that mercury in liquid form reduced from the mercury compound during cell operation rapidly and uniformly wets the mercury coated powders rather than agglomerate and thereby form means which could internally short circuit the cell or contaminate the cell anode.

3,630,780

METHOD OF PRODUCING SILVER OXIDE AND NICKEL CONTAINING ELECTRODES FOR ELECTRIC BATTERIES

Dietrich Berndt, Kronberg; Walter K. Lux, Garching an der Alz, and Kurt Weidinger, Friedrichsdorf, all of Germany, assignors to Varta Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 14, 1970, Ser. No. 54,839
Claims priority, application Germany, Aug. 5, 1969, P 19 39 713.8
Int. Cl. H01m *13/00*
U.S. Cl. 136—20 **6 Claims**

Silver oxide electrodes for electric batteries, particularly primary batteries capable of delivering a high-temporary current output, are produced by compressing a mixture of 10 to 40 percent by weight of pulverulent silver oxide and 60 to 90 percent of pulverulent nickel, and hard-pressing the resulting compressed layer onto a carrier structure, preferably of copper or silver, at pressures of about 0.5 to about 1.4 t/cm.^{2} in an oxidizing or inert atmosphere at a hot-pressing temperature below the dissociation temperature of the silver oxide, this temperature being generally between about 100° and about 300° C.

3,630,781

PROCESS OF FORMING RECHARGEABLE ELECTRODES UTILIZING UNSINTERED FLUOROCARBON BINDER

Guy Rampel, Gainesville, Fla., assignor to General Electric Company

Filed July 13, 1968, Ser. No. 742,156
Int. Cl. H01m *43/02*
U.S. Cl. 136—31 **9 Claims**

Polytetrafluoroethylene in aqueous dispersion is mixed with a finely divided electrochemically active rechargeable electrode material, such as zinc, zinc oxide, cadmium, cadmium oxide, nickel oxide, copper, copper oxide, silver, silver oxide, mercuric oxide, etc. The dispersion is broken by drying, freezing, solvent extraction, etc. Where zinc particles form the active material it may be desirable to amalgamate the zinc with mercury.

3,630,782

SEA WATER BATTERY COMPRISING A CAPACITOR WITHIN THE BATTERY ELECTROLYTE PORT AND A METHOD OF MINIMIZING INTERCELL SHORT CIRCUITS

Edwin K. Butler, deceased late of, St. Petersburg, Fla. (by Adrina Neil Butler, beneficiary of the estate) 6762 17th St. South St. Petersburg, Fla. 33712

Filed Oct. 10, 1969, Ser. No. 865,429
Int. Cl. H01m *17/00*
U.S. Cl. 136—100 **8 Claims**

A method and apparatus for maximizing the electrical potential of primary batteries of the type immersible in an electrolyte comprising placing a foraminous capacitor within the battery electrolyte port or ports.

3,630,783

HEAT-SHRINKABLE PACKAGING FOR BATTERIES

Franciszek Przybyla, Toronto, Ontario, Canada, assignor to Mallory Battery Company of Canada Limited, Clarkson, Ontario, Canada

Filed May 11, 1970, Ser. No. 36,173
Int. Cl. H01m *21/00*
U.S. Cl. 136—107 **9 Claims**

A heat-shrinkable insulating jacket surrounds the cell can, and is thus anchored and holds a cell-closure disc tightly to close the cell. A filament between can and jacket holds them slightly spaced along the filament enough to define two adjacent and parallel narrow limited air passages to serve as a vent passage alongside the filament.

3,630,784

PREPARATION OF OXYGEN ELECTRODES FOR FUEL CELLS

Wolfgang Kuhn, Frankfurt am Main-Griesheim; Werner Lindner, Niederhochstadt, and Gerd Sandstede, Frankfurt am Main, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 10, 1967, Ser. No. 659,619
Claims priority, application Germany, Nov. 2, 1966, B 89654
Int. Cl. H01m *13/04*; **B22f** *7/00*
U.S. Cl. 136—120 FC **7 Claims**

Two layers where each contains a skeleton-forming fluorine-containing resin and only the first layer contains silver carbonate are pressed together to a disc. At least the first layer contains a water-soluble salt which is leached out to form pores. The silver carbonate is reduced to catalytically

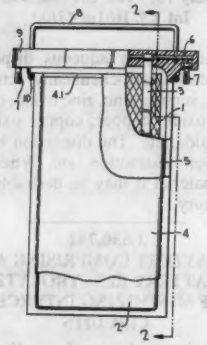
active metallic silver. In the obtained electrode, the first silver-containing layer is electrically conductive and wettable by the electrolyte, the second layer is hydrophobic and its pores suitable to retain the oxygen.

3,630,785

ANODE WITH A TWO LAYERED SEPARATOR

Bruce Jagid, Whitestone, and Hong Po Louie, Brooklyn, both of N.Y., assignors to Leesona Corporation, Warwick, R.I.

Filed Apr. 4, 1968, Ser. No. 718,895
Int. Cl. H01m *3/02, 13/06*
U.S. Cl. 136—120 **8 Claims**



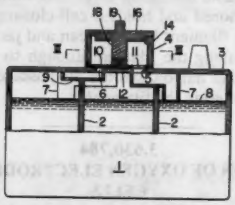
An improved anode primarily for use in a metal/air or metal/oxygen cell is described. The anode comprises a porous metal body wrapped in a first layer of hydrophilic gas impermeable material, such as a cellulosic membrane, having a plurality of slits or holes therein. A second layer of material which is hydrophilic, dimensionally stable, and heat sealable, such as copolymers of vinylchloride and acrylonitrile is placed over or around the first layer of material.

3,630,786

STORAGE BATTERY HAVING LIQUID-FILLING MEANS

Motoharu Nishimura, Ibaraki, and Masatugu Yoshida, Takatsuki, both of Japan, assignors to Yuasa Battery Company Limited, Takatsuki, Osaka Prefecture, Japan

Filed Oct. 7, 1969, Ser. No. 864,391
Int. Cl. H01m *1/02, 7/00*
U.S. Cl. 136—170 **4 Claims**



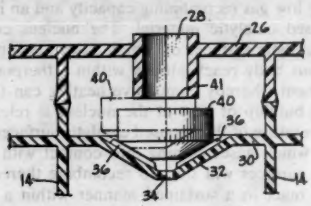
This invention relates to a liquid filling means equipped monoblock battery. The filling means comprises a cylindrical liquid receptacle and a rotary disc fitted thereinto and functions in the manner that when the disc is turned to bring its holes into communication with the liquid inlets of the cylindrical liquid receptacle, the exhaust ports of the receptacle are closed and when the holes are disconnected from the inlets, the ports communicates with the holes. The inlets and ports are connected to cells by ducts and exhaust pipes, respectively, and the lower ends of the ducts are on the same level as the normal level of electrolyte.

3,630,787

BATTERY HAVING INTERNAL SEAT FOR CONFINING A MOVEABLE MEMBER

James W. Consolloy, Pennington, N.J., assignor to ESB Incorporated

Filed Jan. 16, 1970, Ser. No. 3,399
Int. Cl. H01m *1/06, 7/00*
U.S. Cl. 136—177 **13 Claims**



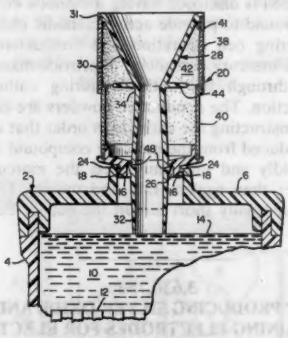
A moveable member is confined between a seat inside a battery and a hole in the battery cover. The seat may be: integrally constructed with the container walls; attached to and depending from either the walls of the container or the underside of the battery cover; sealed between the cover and container; or otherwise locked in place by the cover and container. The moveable member may be designed to function along with the cover as a nonspill vent by sealing off the hole in the cover when the battery is tilted beyond a preselected angle or to function as an indicating device to indicate when the height or the specific gravity of the electrolyte departs from a preselected point.

3,630,788

VENTING AND FILLING DEVICE FOR STORAGE BATTERIES

Roy Erving Hennen, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Aug. 4, 1969, Ser. No. 847,353
Int. Cl. H01m *1/06*
U.S. Cl. 136—177 **6 Claims**



A venting and filling device for a storage battery which comprises a funnel tube extending vertically through an opening in the cover of the battery and being adapted to be moved from a lower position to an upper position; in its lower position the tube defining a venting space within the opening and extending below the level of electrolyte within the battery and in the upper position the tube closing off the venting space and extending to a level substantially equal to the proper operating level of electrolyte in the battery; and an explosion-proof venting means operatively associated with the funnel tube and the battery cover for safely venting explosive gases escaping from the battery through the venting space.

3,630,789

HEXAVALENT CHROMIUM/FUMARATE SOLUTIONS AND THE TREATMENT OF METAL SUBSTRATES THEREWITH

Alden J. Deyrup, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 2, 1970, Ser. No. 25,235
Int. Cl. C23f 7/26
U.S. Cl. 148—6.2 19 Claims

Aqueous solutions having a pH of 1.8 to 5.0 and containing about 0.00001 to 0.02 gram atom per liter of hexavalent chromium and 0.001 to 0.8 gram formula weight per liter of fumaric acid, and the use of such solutions for pretreating base metal substrates at a temperature of about 25° to 100° C. to improve the adhesive bonding to the base metal substrate of a subsequently applied organic polymer coating, particularly a coating of a thermoplastic polymer such as polyethylene. Preferably, the polymer that is bonded to the pretreated substrate has uniformly dispersed therein a finely divided alumina which has a specific surface area of at least 5 square meters per gram and which is substantially free of combined water.

3,630,790

METHOD OF PROTECTION OF METAL SURFACES FROM CORROSION

Donald L. Schmidt, and William J. Leahy, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 13, 1969, Ser. No. 824,246
Int. Cl. C23f 7/00
U.S. Cl. 148—6.15 R 8 Claims

The present invention is a method of protecting metal surfaces from corrosion which comprises contacting the metal with an organo phosphonic, phosphonous or phosphinic acid.

3,630,791

PROCESS OF SURFACE TREATMENT OF METALS

Hidehisa Yamagishi, Kawasaki-shi; Hirokuni Mizuno, Kanagawa-ken, and Masao Okawa, Irima-gun, Saitama-ken, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Jan. 31, 1969, Ser. No. 795,733
Claims priority, application Japan, Feb. 10, 1968, 43/8071
Int. Cl. C23f 7/26
U.S. Cl. 148—6.2 7 Claims
0000

In a process of treating metals to form anticorrosive coatings, use is made of a treating solution containing a copolymer of itaconic acid and acrylonitrile and chromatic acid or chromates.

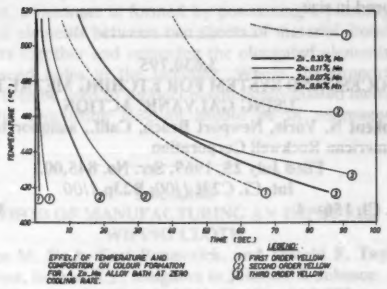
3,630,792

PROCESS FOR THE PRODUCTION OF COLORED COATINGS

Robert William Smyth, Oakville, Ontario, and Gerald Perley Lewis, Streetsville, Ontario, both of Canada, assignors to Cominco Ltd., Montreal, Quebec, Canada

Continuation-in-part of application Ser. No. 574,684, Aug. 24, 1966, now Patent No. 3,530,013. This application Apr. 28, 1969, Ser. No. 819,930
Int. Cl. C23f 7/02
U.S. Cl. 148—6.3 67 Claims

A process for the production of colored surfaces on zinc, tin and lead-tin coatings by the provision of oxide films having light interference effects; zinc, tin and lead-tin alloys for use in the process; and alloy coating compositions and colored articles produced thereby. A molten alloy of zinc, tin or lead-tin with a minor amount of an oxygen-avid element such as titanium, manganese or vanadium is oxidized by exposure to a free oxygen-containing gas under controlled time and temperature conditions for the provision of a surface



EFFECT OF TEMPERATURE AND COMPOSITION ON COLOUR FORMATION FOR A Zn-Mn ALLOY BATH AT ZERO COOLING RATE.

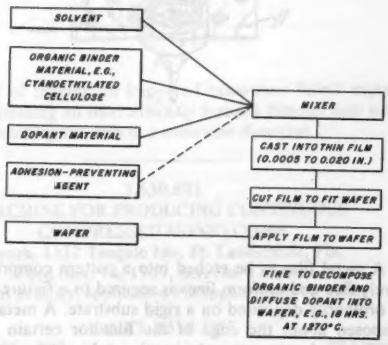
film of an oxide of the oxygen-avid addition element having light interference color characteristics.

3,630,793

METHOD OF MAKING JUNCTION-TYPE SEMICONDUCTOR DEVICES

Ralph W. Christensen, Butler; Everett C. Smith, Sarver, both of Pa., and George Tibol, Fairview, N.J., assignors to Solitron Devices, Inc., Tappan, N.Y. and Semi-Elements, Inc., Saxonburg, Pa., part interest to each

Filed Feb. 24, 1969, Ser. No. 801,667
Int. Cl. H01l 7/44
U.S. Cl. 148—188 4 Claims


SOLVENT
ORGANIC BINDER MATERIAL, E.G., CYANOETHYLATED CELLULOSE
DOPANT MATERIAL
ADHESION-PREVENTING AGENT
WAFER
MIXER
CAST INTO THIN FILM (0.0005 TO 0.020 IN.)
CUT FILM TO FIT WAFER
APPLY FILM TO WAFER
FIRE TO DECOMPOSE ORGANIC BINDER AND DIFFUSE DOPANT INTO WAFER, E.G., 18 HRS. AT 1270°C.

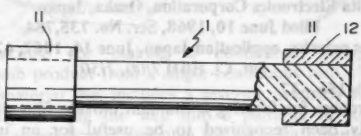
This patent discloses a method for making junction-type semiconductor devices in which dopant is introduced into a wafer from a prefabricated source film.

3,630,794

METHOD OF CHEMICALLY MACHINING ALUMINA

Henry P. Kirchner, 700 South Sparks Street Borough, State College, Pa.

Continuation-in-part of application Ser. No. 664,732, Aug. 31, 1967, now abandoned. This application Feb. 16, 1970, Ser. No. 11,857
Int. Cl. C23f 1/00; C23g 1/28
U.S. Cl. 156—2 4 Claims



A method of chemically machining alumina, comprising the steps of covering the portions of an alumina body to be

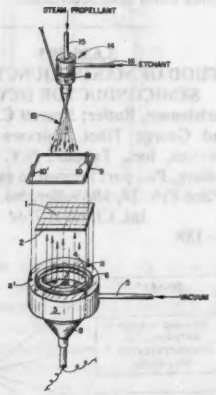
machined, packing the alumina in a fluoride packing material, and refiring the alumina at a refiring temperature, whereby the uncovered portions of the alumina will be reduced in size.

3,630,795

PROCESS AND SYSTEM FOR ETCHING METAL FILMS USING GALVANIC ACTION

Innokent N. Vorie, Newport Beach, Calif., assignor to North American Rockwell Corporation

Filed July 25, 1969, Ser. No. 845,003
Int. Cl. C23f 1/00; B23p 1/00
U.S. Cl. 156—4 **3 Claims**



A metal film to be etched into a pattern comprising relatively fine and uniform lines is secured to a fixture. The film is ordinarily deposited on a rigid substrate. A metal frame is disposed about the edge of the film for certain metals to produce galvanic action during the etching process. The galvanic action increases the rate of etching and produces uniform etching from the outside of the film towards the center. After the film is in place, an etchant is sprayed onto the film at a relatively high velocity and constant temperature until the etching process is complete. A light source, placed behind the film, which is opaque, prior to the etching, is used to observe the etching process so that it can be discontinued when the etched pattern is eliminated.

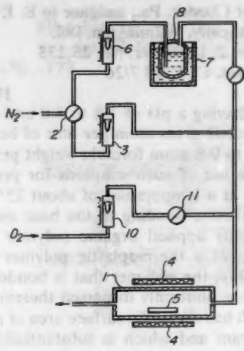
3,630,796

PROCESS FOR FORMING A TITANIUM DIOXIDE FILM

Masami Yokozawa, Osaka; Hitoo Iwasa, Toyonaka-shi, and Iwao Teramoto, Ibaragi-shi, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed June 10, 1968, Ser. No. 735,784
Claims priority, application Japan, June 14, 1967, 42/38536
Int. Cl. H01l 7/00, 7/50
U.S. Cl. 156—17 **5 Claims**

A process for forming a titanium dioxide film which has recently been recognized to be useful for an insulating material for film capacitors and other electric circuit, by feeding a mixed gas of vapor of organo oxy titanium compound, oxygen and carrier gas to the surface of heated baseplate to grow an amorphouslike titanium dioxide film on said surface of baseplate, and if necessary, crystallizing said



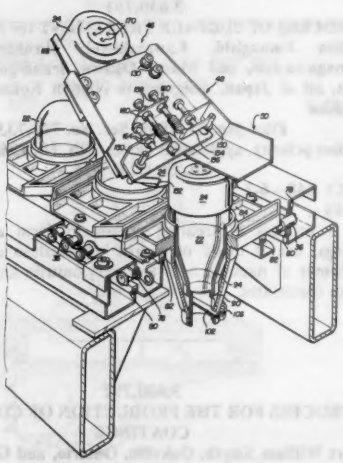
titanium dioxide film with a heat treatment in order to stabilize the film.

3,630,797

METHOD AND APPARATUS FOR ASSEMBLING BULB-SHAPED GLASS CONTAINERS HAVING CYLINDRICAL BASE ELEMENTS

James D. Mallory, Maumee, and Frederick L. Wallington, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc.

Filed Dec. 9, 1969, Ser. No. 883,515
Int. Cl. C09j 5/00; B22b 31/00
U.S. Cl. 156—69 **18 Claims**



Methods and apparatus for assembling composite containers consisting of bulb-shaped glass containers having spherically shaped bottoms with cylindrical base elements fixed to the bottoms. Cylindrical base elements are fed by a chute to a resiliently releasable discharge gate in the path of travel of inverted bulb-shaped glass containers along a conveyor, the container stripping its base element from the chute discharge gate as the container is conveyed past the gate. The base element is subsequently oriented, aligned and permanently bonded to the bulb-shaped container. Bonding is accomplished by use of a hot melt adhesive applied to the base element, said adhesive being activated by the residual heat of the container. The container conveyor supports nor-

mal sized containers at a fixed elevation during the assembly operation, but permits over-length containers to be depressed by a height-limiting device to avoid interference with the discharge gate.

3,630,798

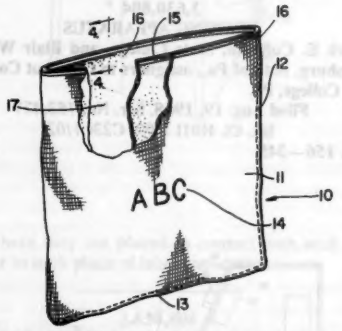
METHOD OF MAKING PLASTIC-LINED BURLAP BAG

Charles S. Wicks, New Orleans, La., assignor to Chase Bag Company

Original application Jan. 4, 1968, Ser. No. 695,645, now Patent No. 3,485,281, dated Dec. 23, 1969. Divided and this application Apr. 23, 1969, Ser. No. 828,061

Int. Cl. B32b *31/04*

U.S. Cl. 156—93 5 Claims



A burlap bag having a polyethylene plastic liner which is secured only at the mouth of the bag by a single line of thermoplastic adhesive which may be reactivated, positioned about the interior edge of the mouth, with the seams of the bag on the inside, the steps of manufacture including first extruding a line of adhesive onto one edge of the burlap, forming the bag in conventional manner, turning the bag, which is formed "wrong" side out, turning and inserting the liner, and reactivating the adhesive to secure the liner at the inside edge of the mouth of the bag only.

3,630,799

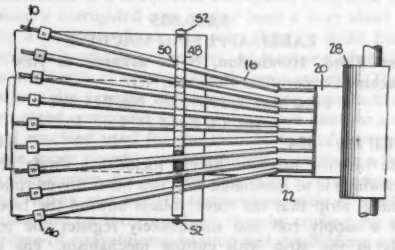
METHOD OF MAKING A SUPPORTING MEDIUM HAVING A PLURALITY OF SPACED HOLES

David J. Crimmins, Stockton, N.J., and Joseph W. Breakfield, Garden Grove, Calif., assignors to Thomas & Betts Corporation, Elizabeth, N.J.

Original application June 6, 1966, Ser. No. 555,421, now Patent No. 3,465,432, dated Sept. 9, 1969. Divided and this application July 7, 1969, Ser. No. 839,278

Int. Cl. B32b *3/20*

U.S. Cl. 156—155 7 Claims



A method of making a supporting medium having a plurality of spaced holes comprising the steps of forming a sheet of material with a plurality of spaced elongated elements such as wires embedded therein and removing the elongated elements to form spaced holes in said sheet. In a preferred embodiment, a laminate is formed by positioning a plurality of elongated elements between two sheets of material, bonding the sheets together and removing the elongated elements to form spaced holes in the laminate. Where the supporting medium is to be used to support magnetically coated memory wires, the supporting medium should be of nonmagnetic material.

3,630,800

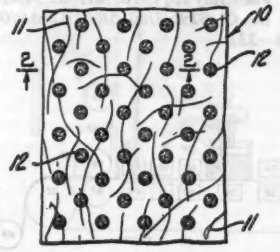
METHOD OF MANUFACTURING AN IMPROVED WIPING CLOTH

Lawrence M. Nash, East Brunswick, and Donald F. Taylor, Somerset, both of N.J., assignors to Johnson & Johnson

Original application July 1, 1966, Ser. No. 562,373, now Patent No. 3,448,478. Divided and this application Dec. 10, 1968, Ser. No. 800,019

Int. Cl. B32b *31/00*

U.S. Cl. 156—229 3 Claims



Method of making an improved nonwoven fabric wiping cloth by treating an intermittently bonded fibrous web with oil and stretching the web in a crosswise direction.

3,630,801

MACHINE FOR PRODUCING CONTINUOUS COMPRESSED HONEYCOMB

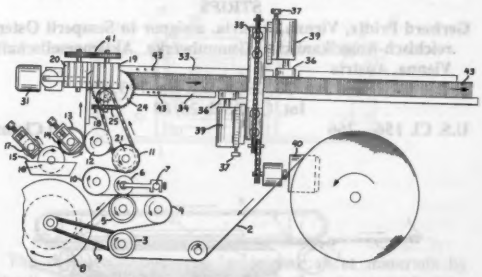
John L. Booth, 1317 Tangelo Isle, Ft. Lauderdale, Fla.

Filed Nov. 14, 1969, Ser. No. 876,665

Claims priority, application Philippines Jan. 14, 1969, 9912

Int. Cl. B31d *3/02*

U.S. Cl. 156—197 27 Claims



A machine for making a continuous unexpanded honeycomb product from a single continuous web of unexpanded material that includes a severing assembly for longitudinally severing the web into a plurality of strips of material, an applicator assembly for applying longitudinally spaced, transverse strips of adhesive to the one face of each of the severed strips of material, an assembly for turning the severed strips into face to face engagement with one another,

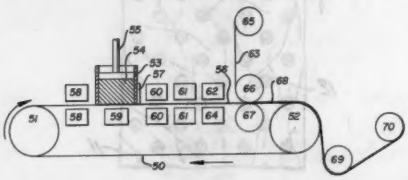
a conveyor assembly to press the adhesive strips of one strip of material against the adjacent strip of material to provide a multiple layer of joined strips of material while the strips of material are pinned to another, a flying saw assembly to transversely sever the multiple layer to be of a predetermined length, a stacking box assembly for joining one face of one multiple layer of adhered strips of material to a face of another multiple layer of adhered strips of material, and a trimmer assembly to trimming the joined multiple layers to a predetermined height. Adjustments are provided for severing different width strips, for controlling the application of adhesive strips, and for varying the thickness of the joined multiple layers. Also, during making of the honeycomb product the strips of material are partially severed to readily permit a block of honeycomb product being pulled apart to provide two honeycomb structures. Also a method of making honeycomb is disclosed.

3,630,802

METHOD AND APPARATUS FOR PRODUCING A COATED SUBSTRATE AND A LAMINATED PRODUCT

Theodore J. Dettling, 57th Castle Blvd., Akron, Ohio

Filed July 13, 1970, Ser. No. 54,428
Int. Cl. B29b *3/00, 5/00;* **B29d** *9/00*
U.S. Cl. 156—231 **28 Claims**



A coated substrate is produced by pressing a solid mass of an organic coating composition against a traveling metal carrier such as an endless metal belt, heating only that part of the coating composition mass adjacent to and contiguous with the carrier to that degree necessary to liquify the coating composition and cause a coating to form and deposit on the carrier, laminating a substrate to the coating, and then removing the resulting coated substrate from the carrier.

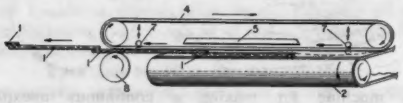
A three-layered laminate having the coating centrally located is produced by laminating a second substrate to the coated side of the coated substrate.

3,630,803

PROCESSES AND DEVICES FOR JOINING FABRIC STRIPS

Gerhard Printz, Vienna, Austria, assignor to Semperit Osterreichisch-Amerikanische Gummiwerke Aktiengesellschaft, Vienna, Austria

Filed Jan. 23, 1969, Ser. No. 793,427
Int. Cl. B32b *25/10*
U.S. Cl. 156—266 **10 Claims**



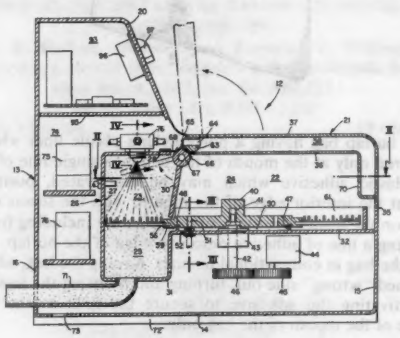
The instant invention concerns a process and a machine for overlapping and in the overlapped position joining single cut strips. The process is carried out with the aid of a conveyor belt and transport means; the transport means transport the strips to a position below the conveyor belt whereupon at least a portion of the conveyor belt is depressed thereby causing the strips thereunder to adhere thereto; subsequently the belt with the strips adhered thereon is raised and the transport means is activated so as to bring in alignment with the belt a next strip which can overlap the just lifted strip; the two overlapping strips are then pressed together and are subsequently removed from the machine. The machine for carrying out the aforesaid process is comprised of transport means which are operative to move the cut strips, a conveyor belt disposed above the transport means and adhesion generating means disposed near the conveyor belt and operative to impart an adhesive effect to a lower portion of said belt. There is also provided lifting means for transporting the strips and roller means to press the strips together.

3,630,804

ETCHING APPARATUS

Frederick E. Coffman, State College, and Blair W. Heffner, Petersburg, both of Pa., assignors to Chemcut Corporation, State College, Pa.

Filed Aug. 19, 1968, Ser. No. 753,477
Int. Cl. H01l *7/00;* **C23f** *1/02*
U.S. Cl. 156—345 **22 Claims**



An apparatus is provided for etching articles, in particular, for etching wafers in accordance with the production of semiconductor devices. The apparatus employs a rotatable conveying device for traversing wafers carried thereby through a spray of acid, neutralizer, water or the like, for a portion of the cycle of operation of the apparatus, the wafers then being air dried during a further portion of the cycle of operation of the apparatus, the air drying cycle generally being conducted at a high speed.

3,630,805

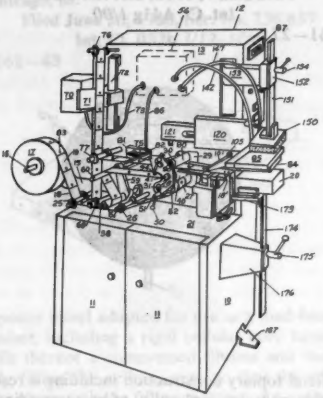
LABEL-APPLYING MACHINE

Walter Fried, Huntington, N.Y., assignor to New Jersey Machine Corporation, Hoboken, N.J.

Filed May 5, 1969, Ser. No. 821,577
Int. Cl. B26d *5/34*
U.S. Cl. 156—354 **8 Claims**

The labeling machine herein includes a single powered roller which is so associated with two other driven rollers and the label strip that the three rollers unwind the label strip from a supply roll and successively register the terminal labels in the strip with cutting mechanism. The cutting mechanism includes a knife that is intermittently actuated to sever the terminal labels by a label carrier for transferring the

labels to a place of label application. This same label carrier also activates an elevator for carrying the severed labels to a



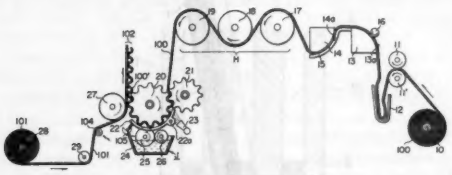
position where they are placed in contact with such carrier for transfer to such place of label application.

3,630,806

APPARATUS FOR THE MANUFACTURE OF PACKAGING MATERIAL HAVING A CORRUGATED CORE SHEET OF SYNTHETIC RESIN

Nobuo Kitajima, and Hisao Inoue, both of Konosu-shi, Japan, assignors to Asahi Shiko Kabushiki Kaisha, Tokyo, Japan

Filed June 27, 1968, Ser. No. 740,617
Claims priority, application Japan, June 28, 1967, 42/41027
Int. Cl. B31f *1/22, 1/28*
U.S. Cl. 156—472 **6 Claims**



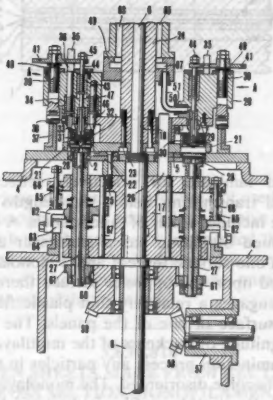
The invention relates to improvements in a machine for the manufacture of a continuous corrugated composite sheet comprising a corrugated core and at least a liner sheet. For attaining a waterproofness, the core sheet is made from a thermoplastic synthetic resin sheet. At least one of the liner sheet is made also of a thermoplastic resin material. The invention provides a simple attachment for the manufacture of the corrugated composite sheet of the above kind, to a conventional machine used for the manufacture of corrugated composite paper boards, said attachment comprising a liquid cooling mechanism for cooling the main corrugating roll positively driven and kept in cooperation with an auxiliary corrugating roll for the core sheet, thereby cooling the main roll in place of conventional heating and establishing a temperature difference of at least 20° C. between the auxiliary roll and the main roll.

3,630,807

MACHINE FOR APPLYING SEALING MATERIAL FOR A CROWN CAP AND THE LIKE

Yukio Fujimura, Shimo-Suwa-machi, Japan, assignor to Kabushiki-Kaisha Sankyo Seiki, Seisakusho, Shimo-suwa-Machi, Japan

Filed Jan. 6, 1970, Ser. No. 936
Claims priority, application Japan, Feb. 26, 1969, 44/14942
Int. Cl. B05c *11/08;* **B05b** *1/06*
U.S. Cl. 156—567 **2 Claims**



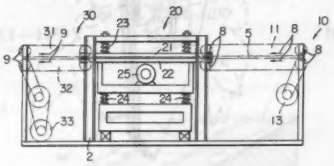
A machine for applying sealing material for crown caps and the like wherein the crown caps travel along a circular path at a fixed rotational speed for attaining a smooth sealing material or lining operation in an uninterrupted manner.

3,630,808

APPARATUS FOR JOINING SHEET MATERIALS BY VIBRATING PLATES

Shinjiro Yasui, No. 37-3 Aza Higashioka, Wassanu-chg, Kamikawa-gun, Hokkaido, Japan

Filed May 10, 1967, Ser. No. 637,493
Int. Cl. B30b *15/34;* **B29c** *27/08*
U.S. Cl. 156—580 **5 Claims**

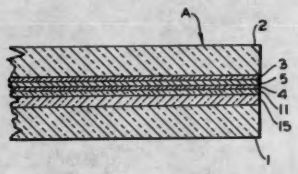


The disclosed apparatus for joining sheet materials by vibrating plates has belt conveyors for continuously feeding the sheet materials carrying to be joined, a vibrating device for vibrating the sheet materials and whereby they are joined and also belt conveyors for removing the joint materials. The vibrating device has a resonant heating plate, a vibrating plate, resilient supporting member and a vibrator. The vibrating plate and the resonant plate are heated by a heating device and transfer heat to the sheet materials.

3,630,809
PELLUCID LAMINATES

James W. Edwards, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Original application Jan. 4, 1965, Ser. No. 423,263, now Patent No. 3,499,697, dated Mar. 10, 1970. Divided and this application Aug. 1, 1969, Ser. No. 846,837
Int. Cl. G02b 5/20; B32b 17/10
U.S. Cl. 161—2 13 Claims

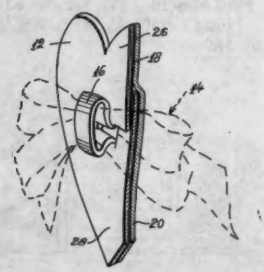


A pellucid laminate for selectively reflecting infrared radiation and transmitting visible wavelengths of radiation. The laminate includes a pair of outer panels. A relatively thin member formed of plastic has a multilayer dielectric film deposited on one surface thereof and a monolayer dielectric film deposited upon the opposite surface thereof. The multilayer film engages a relatively thin plastic film formed on the interior surface of one of the panels. The film is in the order of magnitude of thickness of the multilayer film so that during the lamination process any particles in the multilayer film will not become disoriented. The monolayer film in combination with the multilayer film is designed to cause some reflection of the transmitted visible radiation. A relatively thick interior panel is disposed beneath the monolayer film and may have incorporated therein light-absorbing compounds in order to reduce angular dependency. A number of methods of laminating the various components are also disclosed.

3,630,810
FLEXIBLE ORNAMENT OF THE STICK-ON TYPE

Virginia D. Mauro, 2340 West 11th St., Brooklyn, N.Y.

Filed Feb. 19, 1969, Ser. No. 800,624
Int. Cl. D04d 7/10
U.S. Cl. 161—9 2 Claims

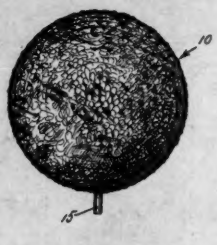


A flexible ornament of the stick-on type adapted to be easily and quickly stuck on various supporting surfaces for ornamenting such surfaces. The ornament has a flexible plastic-coated cloth tape preferably heart shaped with a loop formed in the center thereof, and a bow formed of a fabric ribbon inserted through the loop and extending across the face of the body. The opposite surface of the body is coated with pressure-sensitive adhesive for pressing the ornament onto a supporting surface such as the hair of a human being or an animal.

3,630,811
ARTIFICIAL TOPIARY CONSTRUCTION

Harvey Radus, 50 Dorchester Road, Scarsdale, N.Y.

Filed Jan. 7, 1970, Ser. No. 1,243
Int. Cl. A41g 1/00
U.S. Cl. 161—27 5 Claims



An artificial topiary construction including a resilient base of penetrable material, a plurality of correspondingly shaped floral-engaging elements, a plurality of artificial floral elements selectively engageable thereupon, and supporting pole means engaging said sphere.

3,630,812
WINDSHIELD FOR MOTOR VEHICLES

Fritz Bruckner; Hans Krings; Hans Peter Siemonsen, and Franz Kramling, all of Aachen, Germany, assignors to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

Filed Jan. 27, 1969, Ser. No. 794,152
Claims priority, application Germany, Jan. 29, 1968, P16 80 001.4, Feb. 7, 1968, P 16 96 051.3
Int. Cl. B32b 3/06, 17/10
U.S. Cl. 161—139 6 Claims

Windshields are constructed on a basis of the tolerance of the human body to impact, with special attention to the tolerance of head and spine, macroscopic lesions on the cervical vertibrae and resistance of the brain to cerebral lesions. The designs contemplate a windshield, of unbreaking center and fragile rim, which will transmit the shock of impact and break the rim in the few microseconds before body tolerance to impact has been exceeded. An impact duration of 30 microseconds is treated as the upper limit of toleration within which the windshield must shear off at its edges. Several designs are disclosed based upon special treatments for the center and the rim.

3,630,813

COMPOSITE PANEL STRUCTURE

John W. Allen, Flossmoor, Ill., assignor to Stanray Corporation, Chicago, Ill.

Filed June 20, 1968, Ser. No. 738,637
Int. Cl. B32b *3/12, 5/16*
U.S. Cl. 161—43 4 Claims

A composite panel adapted for use as a load-bearing structural member, including a rigid cellular core having bonded in the cells thereof a compressed fibrous and resin mixture completely filling the cellular core so that the edges of the core are in plane with the filling material. An embodiment of the composite panel includes a high-wear resistance skin, such as fiber glass cloth, bonded to the outer faces of the filler material for assuming the wear.

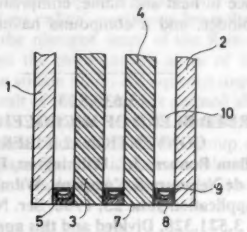
The disclosure also relates to a method for forming the above-described composite panel in which the filler material is placed on the core and is then compressed therein between heated press plates and held therein under pressure until the resin is cured and the material bonded to the cellular core.

3,630,814

COMPOSITE BULLETPROOF WINDOW PANEL

Alfred Arnold, Alfred-Klingele-str. 7064, Geradstetten, Germany

Filed Apr. 25, 1969, Ser. No. 819,405
Claims priority, application Austria, May 17, 1968, A 4766/68
Int. Cl. E04c *2/23*; E04b *2/28*; F41h *5/00*
U.S. Cl. 161—45 8 Claims



A bulletproof composite window panel has two outer glass panes with two inner plastic panes being located between the glass panes, each pane being spaced from but parallel to its neighboring panels. Tubular spacing members of substantially semicircular cross section are located between juxtaposed circumferentially extending marginal portions of the respective panels to prevent the panels from contacting each other, and sealing means seals the spaces between the panels along the circumferentially extending marginal portions.

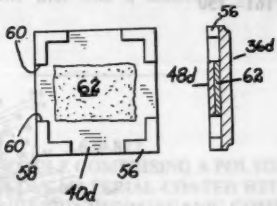
3,630,815

VARIABLE ORNAMENTAL DESIGN

Anthony G. Rosa, 216 Post Avenue, Lyndhurst, N.J.

Filed May 8, 1968, Ser. No. 727,490
Int. Cl. B43m *17/00*; G09f *7/02*
U.S. Cl. 161—40 2 Claims

The present invention relates to a decorative arrangement for desk sets and the like. Generally, the member to be decorated is rectangular in shape. The member is provided with a plurality of grooves which run the length of the member and are adapted to receive a plurality of moveable letters. The movable letters or monograms may be fit into one or all of the grooves and are interchangeably connecta-



ble in the various grooves. The grooves not used to house the letters or monograms are adapted to receive a decorative stripping which may be removably connected therein or permanently fixed in position. A V-shaped slot may be provided in the center of the member and runs parallel with the grooves the length of the member.

3,630,816

NONWOVEN SHEETS MADE FROM RECTANGULAR CROSS SECTION MONOFILAMENTS

Phillip H. Parker, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed July 25, 1969, Ser. No. 845,075
Int. Cl. D01d *5/22, 7/00*; B32b *27/02*
U.S. Cl. 161—72 5 Claims

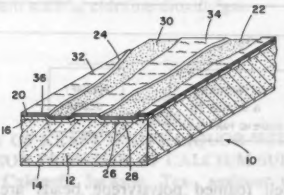
Nonwoven sheets of continuous synthetic polymer, e.g., stereoregular polypropylene, monofilaments which have elongated, e.g., rectangular, cross sections with aspect ratios of at least about 3:1 and are disposed randomly and are substantially discrete from each other except at crossover points in the sheet. These sheets may be made by extruding the polymer through appropriately shaped orifices, partially cooling the resulting monofilaments, drawing them with a pneumatic jet and depositing them on a collecting device.

3,630,817

PREDECORATED GYPSUM BOARD

Daniel A. Winkowski, Tonawanda, N.Y., assignor to National Gypsum Company, Buffalo, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,192
Int. Cl. B32b *3/00*
U.S. Cl. 161—119 10 Claims



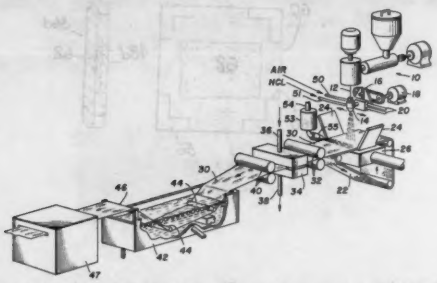
Predecorated, washable gypsum board having a plastic base film throughout the front surface and an embossed, printed design extending into the front surface.

3,630,818

LIGHTWEIGHT NONWOVEN FABRIC OF INCREASED OPACITY

Emerick J. Dobo, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed July 22, 1969, Ser. No. 843,711
Int. Cl. D04h 3/14, 5/00
U.S. Cl. 161—150 2 Claims



A lightweight nonwoven fabric having a high degree of opacity comprises a nonwoven web of continuous synthetic polyamide filaments autogenously bonded together and short lengths of polyamide ligaments dispersed among the continuous filaments.

3,630,819

FOAMED POLYURETHANE LAMINATES

Marvin T. Conger, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 23, 1968, Ser. No. 761,451
Int. Cl. B32b 3/00, 3/26
U.S. Cl. 161—161 4 Claims

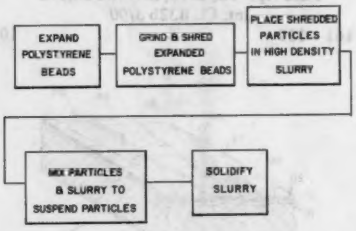
This invention relates to laminates useful as building boards or panels and which comprises a rigid foamed polyurethane core covered on at least two faces with a decorative film.

3,630,820

GRANULAR FORMATIONS INCLUDING OPEN CELL POLYSTYRENE PARTICLES

Irby H. Leach, 2094 Emerson, Napa, Calif.

Filed July 25, 1969, Ser. No. 844,895
Int. Cl. B32b 5/18
U.S. Cl. 161—168 2 Claims


EXPAND POLYSTYRENE BEADS
GRIND & SHRED EXPANDED POLYSTYRENE BEADS
PLACE SHREDDED PARTICLES IN HIGH DENSITY SLURRY
MIX PARTICLES & SLURRY TO SUSPEND PARTICLES
SOLIDIFY SLURRY

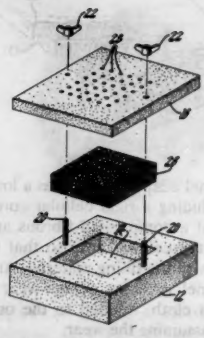
Closed-cell foamed polystyrene beads are shredded to form small size, open-celled foam particles. The particles are mixed with a slurry of a granulate and a liquid whereby the slurry enters the open cells to increase the density of the particles and suspend the particles in the slurry without floating the particles to the top. After an even distribution of the particles throughout the slurry is obtained the mixture is dried to form granulate objects, such as boards, having an even distribution of foamed polystyrene particles therein to reduce the density of the object.

3,630,821

POPCORN ENERGY ABSORBER

William K. Miller; Seymour Katz, both of Southfield, and Willard W. Bach, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Original application July 20, 1967, Ser. No. 614,829, now Patent No. 3,511,899, dated May 12, 1970. Divided and this application Jan. 19, 1970, Ser. No. 3,600
Int. Cl. B32b 3/26, 5/20
U.S. Cl. 161—168 2 Claims



An energy-absorbing article comprised of a plurality of expanded popcorn kernels closely packed together and bonded together by the mechanical interlocking of the irregular outer surfaces of the expanded kernels, the density of the article being 5–15 pounds per cubic foot.

3,630,822

ACOUSTICAL AND FIRE RESISTANT PARTICLEBOARD

Andrew E. Carmellini, Brookfield, Conn., assignor to U. S. Plywood-Champion Papers Inc., New York, N.Y.

Filed Sept. 2, 1970, Ser. No. 69,145
Int. Cl. B32b 5/14, 5/16, 21/02
U.S. Cl. 161—168 9 Claims

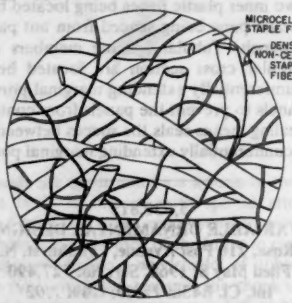
A high-density particleboard of great sound attenuation and resistance to heat and flame, comprising wood particles, a suitable binder, and a compound having a density of at least 4.

3,630,823

COCARDED BLEND OF MICROCELLULAR AND CONVENTIONAL FIBERS

Willard Hallam Bonner, Jr., Wilmington, Del., assignor to E. I. duPont de Nemours & Company, Wilmington, Del.

Original application June 23, 1966, Ser. No. 559,979, now Patent No. 3,521,328. Divided and this application Sept. 16, 1969, Ser. No. 870,723
Int. Cl. A47c 27/22
U.S. Cl. 161—169 7 Claims



A cocarded blend of 1–80 percent closed-cell microcellular staple fibers and 99 percent to 20 percent dense, substan-

tially noncellular staple fibers is cardable and inexpensive and has desirable bulk, resiliency, load bearing capacity and recovery upon removal of a load.

3,630,824

HOLLOW MONOFILAMENT OF HIGH-LOADING CAPACITY AND METHOD OF MAKING SAME

Gunter Rohlig, Remscheid-Lennep, Germany, assignor to Barmag Barmer Maschinenfabrik AG, Wuppertal, Germany

Filed May 19, 1969, Ser. No. 825,608
Claims priority, application Germany, May 22, 1968, P 17 60 467.0
Int. Cl. D01d *5/24*
U.S. Cl. 161—178 **10 Claims**

Process for producing an industrial monofilament of a fiber-forming thermoplastic polymer in which the polymer is melt spun as a hollow filament into an aqueous bath and withdrawn therefrom through a hot air zone while stretching in both the bath and the hot air zone to reduce the hollow cross section to less than 15 percent and especially less than 3 percent of the total cross section. The resulting monofilaments with a relatively fine hollow channel and outer diameters between about 0.8 and 8 mm. are useful for making nets, ropes, fishing lines and the like.

3,630,825

COUPLING AGENT FOR EPOXY RESIN COMPOSITE ARTICLES

John R. Marecek, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed July 1, 1969, Ser. No. 838,323
Int. Cl. B32b *17/04, 27/38*
U.S. Cl. 161—185 **6 Claims**

There is disclosed a coupling agent useful for the preparation of epoxy resin composite articles which is an aqueous dispersion of a copolymer consisting essentially of from 33 to 86 percent by weight of $C_6H_5(CH_3)SiO$ units and 14 to 67 percent by weight of $R_2N–A–SiO_{3/2}$ units, wherein each R is selected from the group consisting of the hydrogen atom, alkyl radicals containing from one to six carbon atoms and aminoalkyl radicals containing from two to six carbon atoms and A is an alkylene radical containing from three to 10 carbon atoms, and the nitrogen atom of the $R_2N–$ group is attached to at least the third carbon atom of the A radical removed from the silicon atom. An aqueous dispersion of the fatty acid amine salt of the copolymer defined above can also be employed. The composite articles consist essentially of (1) a base member selected from the group consisting of glass cloth and glass fibers, said base member having on its surface a copolymer as defined above, and (2) a cured epoxy resin.

3,630,826

WATER AND OXYGEN IMPERMEABLE FILM LAMINATE BONDED BY SARAN AND POLYISOCYANATE WITH A CURING AGENT

Henry J. Rose, and Albin F. Turbak, both of Danville, Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed May 23, 1968, Ser. No. 731,519
Int. Cl. B32b *27/30, 27/38, 27/40*
U.S. Cl. 161—190 **2 Claims**

Impermeable plastic film laminates for use in the packaging of food products and other materials are formed by lamination of polyethylene or other plastic films to plastic films such as nylon, polyester, cellophane, polypropylene, polyethylene, polyvinyl chloride, etc., by using an improved oxygen impermeable saran-containing adhesive composition as the laminating adhesive. The improved saran-containing adhesive composition of this invention includes a polymeric polyisocyanate adhesive and a suitable cross-linking agent therefor, in addition to the vinylidene chloride-acrylonitrile or other saran resin (copolymer or polymer). The adhesive composition is self-curing and the resulting film laminate is flexible and highly impermeable to oxygen while the adhesive layer is highly resistant to the action of boiling water. The cross-linking agent can be a glycol, triol, polyglycol, polytriol or any long-chain polyol, or a derivative thereof, such as a partial ester of a polyol. The preferred cross-linking agent is a polyoxypropylene triol with a molecular weight about 1,000.

3,630,827

LAMINATED ARTICLE COMPRISING A POLYOLEFIN AND A SILICEOUS MATERIAL COATED WITH A SILANE AND A CHLORINATED ORGANIC COMPOUND

Robert C. Hartlein, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of application Ser. No. 788,907, Jan. 3, 1969, now abandoned. This application Aug. 5, 1970, Ser. No. 61,505
Int. Cl. B32b *5/16, 17/06;* **C03c** *17/30*
U.S. Cl. 161—193 **8 Claims**

Polyolefin resins, such as polypropylene, are strengthened by the incorporation of a siliceous reinforcing material which has a first coating (a) of a silane coupling agent, such as $(C_2H_5O)SiCH_2CH_2CH_2CH_2NHCH_2CH_2NH_2$, and a second coating (b) of a chlorinated organic compound, such as perchlorinated para-xylene.

3,630,828

BLEACHING OF A LOW-DENSITY, SUBSTANTIALLY UNCOMPACTED, POROUS FLUFFED CELLULOSIC PULP

Norman Liebergott, Chomedy, Quebec; Frederic H. Yorston, Montreal, Quebec; Raimbault M. A. T. De Montigny, Baie D'Urfe, Quebec, and John E. Tasman, Pointe Claire, Quebec, all of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada

Filed May 13, 1968, Ser. No. 728,633
Int. Cl. D21b *1/16*
U.S. Cl. 162—24 **10 Claims**

The bleaching of chemical wood pulp at high consistencies with gaseous bleaching agents is performed by repeatedly contacting the pulp, at a consistency above 15 percent and while unsupported, with radial spaced breaker arms extending from a rotating shaft thereby producing a comminuted pulp of low density and a substantially uncompacted porous fluffed structure and thereafter bleaching the comminuted fluffed pulp at a consistency above 15 percent with a gaseous bleaching agent such as chlorine dioxide gas.

3,630,829

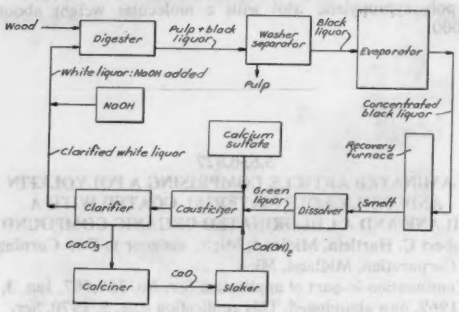
RECOVERY OF KRAFT WHITE LIQUOR WITH SULFUR ADDITION PROVIDED BY CALCIUM SULFATE

Donald Lee Caldwell, Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 18, 1969, Ser. No. 834,330
Int. Cl. D21c *11/04*
U.S. Cl. 162—30 **6 Claims**

The present invention relates to a method of recovering kraft pulping liquor. During causticization of the green liquor, calcium sulfate is added to produce a white liquor with a higher than normal active alkali content. Further,

NaOH can be added to the liquor to balance the added sulfur content introduced by the $CaSO_4$. The present method also



eliminates the need for the conventional Na_2SO_4 addition to the black liquor.

3,630,830

METHOD FOR SURFACE SIZING OF PAPER

Lloyd E. Herdle, and Oliver J. Schulwitz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 30, 1969, Ser. No. 837,864
Int. Cl. D21h *1/10*
U.S. Cl. 162—135 **20 Claims**

Paper or a paper product which has been internally sized prior to web formation by incorporation in the pulp slurry of a fatty acid sizing agent, such as the sodium salt of stearic acid, and precipitation of the sizing agent onto the pulp fibers with a water-soluble polyvalent metal salt, such as alum or aluminum chloride, is surface sized after web formation with an aqueous solution containing an aldonic acid such as gluconic acid or a water-soluble salt of an aldonic acid such as sodium gluconate.

3,630,831

BINDING AGENT FOR NONWOVEN MATERIALS AND NONWOVEN MATERIAL MADE THEREWITH

Hendrik Jongetjes, Heemskerk, Netherlands, assignor to Koninklijke Papierfabrieken Van Gelder Zonen N.V.

Filed Oct. 28, 1968, Ser. No. 771,304
Claims priority, application Netherlands, Nov. 1, 1967, 6714866
Int. Cl. D21f *11/00*
U.S. Cl. 162—156 **15 Claims**

A suspension of a binding agent for nonwoven materials is prepared by dispersing particles of a polymer swellable in cold water and soluble in warm water such as starch or polyvinyl alcohol in a solution of a cross-linking agent such as formaldehyde and a cross-linking catalyst such as hydrochloric acid wherein the particles swell and substantially completely absorb the solution. This mass is maintained at substantially room temperature until the cross-linking agent partially reacts and thereafter the dispersion is diluted. The diluted dispersion may be partially neutralized to a pH at which the cross-linking agent is substantially prevented from reacting with the polymer. The binding agent is dispersed in a fiber dispersion and a web is formed which is thereafter heated to at least 140° C. to complete the cross-linking of the polymer.

3,630,832

CONTROLLED ALKALINE SULFITE PULPING

Otto V. Ingruber, Vankleek Hill, and Glenn A. Allard, Hawkesbury, Ontario, both of Canada, assignors to Canadian International Paper Company, Montreal, Quebec, Canada

Continuation of application Ser. No. 706,154, Feb. 16, 1968, now abandoned. This application Nov. 10, 1969, Ser. No. 871,646
Int. Cl. D21c *7/14*
U.S. Cl. 162—49 **5 Claims**

A controlled process of producing sulfite pulps from wood and other cellulosic material wherein the use of sodium sulfide is avoided and the process pH, i.e., the pH in situ or the so-called hot pH, is measured during the pulping or cooking operation and the alkalinity of the cooking medium is adjusted in response to such measurement in a predetermined manner.

3,630,833

PROCESS FOR MAKING MOISTURE RESISTANT, STIFFENED PAPER CONTAINING ISOPRENE RESIN AND PRODUCT

Rodger L. Fife, San Jose, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Feb. 12, 1969, Ser. No. 798,771
Int. Cl. D21d *3/00;* **D21h** *3/02*
U.S. Cl. 162—163 **10 Claims**

An aqueous mixture of lignosulfonate and an isoprene resin ground to particulate form having a melting point of 80–130° C. in the ratio of liquosulfonate to isoprene resin in the range of 0.2:1 to 4:1 based on the dry weights is added to an aqueous slurry of cellulosic fibers. The aqueous mixture of liquosulfonate and resin can be stabilized with acetic acid or a mixture of acetic acid and an alkali metal acetate. A paper web is formed from the slurry, dewatered and heated to a temperature exceeding the melting point of the isoprene resin to fix the resin onto the cellulosic fibers without requiring a fixing agent.

3,630,834

SIZING PAPER WITH ISOTHIOURONIUM SALTS OF POLYGLYCIDYL ETHERS OF POLYHYDRIC PHENOLS

Bart J. Bremmer, and Fred J. Meyer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 1, 1970, Ser. No. 33,924
Int. Cl. D21h *3/48*
U.S. Cl. 162—164 **10 Claims**

A process for sizing paper by adding a water-soluble isothiouronium salt of a polyglycidyl ether of a polyhydric phenol to an acid or neutral slurry of cellulose pulp, adjusting the pulp pH to about 8–10 and then forming and drying the paper sheet. Preferably the salt is the thiourea derivative of a diglycidyl ether of a bisphenol.

3,630,835

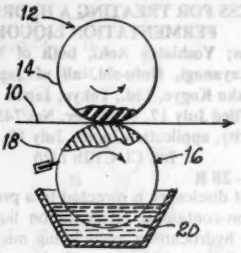
METHOD FOR COATING PAPER WITH PRESSURE RUPTURABLE FLUID CONTAINING CAPSULES

Thomas W. Busch, Appleton, Wis., assignor to Appleton Coated Paper Company, Appleton, Wis.

Filed Feb. 13, 1968, Ser. No. 705,076
Int. Cl. D21d *3/00*
U.S. Cl. 162—184 **8 Claims**

The invention in a machine and method for "on-the-machine" coating of a paper web to coat one surface of the paper web with a uniform distribution of pressure rupturable liquid containing capsules wherein the papermaking machine is provided with a printing couple while the paper is in a substantially uncured state with one roll of the couple comprising an impression roller having a resilient surface and the other roll comprising a printing roll having a multiplicity of cells uniformly distributed in closely spaced-apart relation in the peripheral surface of the roll with means for application of the fluid composition containing the rupturable capsules in

suspension onto the peripheral surface of the roll in an amount at least sufficient to fill the cells and means for doctoring the peripheral surface of the roll to remove coating composition from the area between the cells whereby, when



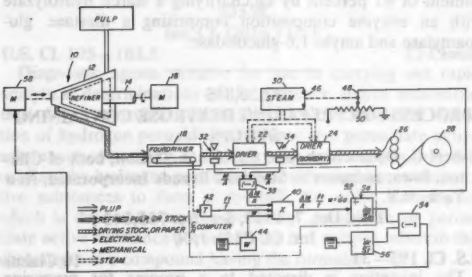
the paper web is advanced in pressure contact between the roll pair, substantially pressureless transfer occurs of the coating composition in the cells to the adjacent side of the paper web to coat the paper web with the pressure rupturable capsules as a continuous operation with papermaking.

3,630,836

CONTROLLING THE CUTTING TO HYDRATION RATIO IN THE REFINING OF PULP

Charles R. Bietry, and Earl D. Hogan, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1969, Ser. No. 863,618
Int. Cl. D21d *1/20*
U.S. Cl. 162—198 **8 Claims**



The quality of paper being manufactured is maintained constant by keeping the cutting to hydration ratio of pulp stock during refining constant. The drying rate of the paper is an indication of the cutting to hydration ratio of the refined pulp stock. The drying rate is compared with a desire drying rate and the difference therebetween is used to adjust the refining so that the actual cutting to hydration ratio is maintained the same as the desired cutting to hydration ratio.

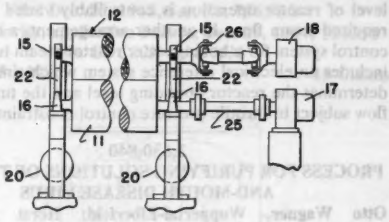
3,630,837

COMPACTING APPARATUS FOR FIBROUS WEBS

Fred H. Freuler, Greenwich, Conn., assignor to Clupak, Inc., New York, N.Y.

Filed Feb. 17, 1969, Ser. No. 799,864
Int. Cl. Z10h *5/00*
U.S. Cl. 162—361 **9 Claims**

Compacting apparatus for producing paper having isotropic extensibility including an elastomeric element having structural components orientated at an oblique angle not less than 15° but not more than 75° with respect to at least one of the principal axes of the pressure nip of the apparatus. The



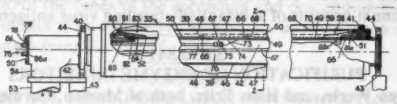
components may be, for example, relatively inelastic cords, coarse hair fibers, or channels.

3,630,838

SUCTION ROLL ASSEMBLY FOR CLEANING FELTS

Edward T. Bryand, South Portland, and Edward G. Peabody, Gorham, both of Maine, assignors to Metal-Tech Inc., Biddleford, Maine

Filed Jan. 16, 1969, Ser. No. 791,573
Int. Cl. D21f *3/10*
U.S. Cl. 162—371 **1 Claim**



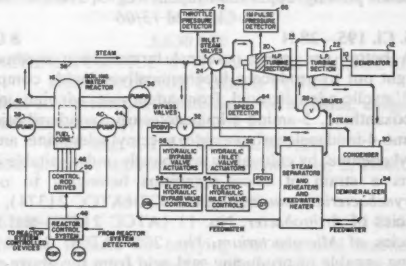
A honeycomb roll is rotatably mounted on a fixed suction pipe to serve as a carrier for a detergent wetted press felt of a papermaking machine, there being sealing strips operable from outside the roll to form a narrow suction slot conduit between the outside of the pipe and the inside of the honeycomb roll. An end seal wall, having a split, sealing insert, located between the sealing strips also moves axially to form deckle means. Each sealing strip includes cam means permitting independent sealing adjustment on each side of the slot.

3,630,839

SYSTEM AND METHOD FOR OPERATING A BOILING WATER REACTOR-STEAM TURBINE PLANT

Leaman B. Podolsky, Wilmington, Del., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 26, 1968, Ser. No. 779,075
Int. Cl. G21c *7/36*
U.S. Cl. 176—24 **11 Claims**



A turbine follow control system for a boiling water reactor-steam turbine plant includes an electrical reference system

which determines the reactor operating level through a reactor control system. The turbine follow control system operates turbine steam valves and steam bypass valves electrohydraulically to control the stem throttle pressure as the level of reactor operation is controllably varied to produce required steam flow. In another arrangement, a coordinated control system for a boiling water reactor-steam turbine plant includes an electrical reference system which simultaneously determines the reactor operating level and the turbine steam flow subject to throttle pressure control constraints.

3,630,840

PROCESS FOR PURIFYING SOLUTIONS OF THE FOOT-AND-MOUTH DISEASE VIRUS

Otto Wagner, Wuppertal-Elberfeld; Horst Geilhausen, Opladen; Hans Bahnemann, and Otto-Erich Schweckendiek, both of Cologne, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 13, 1970, Ser. No. 19,515
Claims priority, application Germany, Mar. 15, 1969, P 19 13 272.0
Int. Cl. C12k *5/10, 7/00*
U.S. Cl. 195—1.5 **4 Claims**

Foot-and-mouth disease virus solutions, used for the preparation of vaccines against the disease, are freed of undesirable protein contaminants accompanying the virus particles by subjecting the impure solution to fractional precipitation with polyethylene glycol solutions. The precipitate, containing the virus intigens is separated from the liquid phase which contains the proteins, preferably by centrifuging. The sediment consists of substantially purified virus antigen.

3,630,841

PURIFICATION OF ENZYME INHIBITORS

Eugen Werle, and Hans Fritz, both of Munich, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 636,612, May 8, 1967, abandoned
Filed Jan. 5, 1970, Ser. No. 826
Claims priority, application Germany, May 26, 1966, F 49 298
Int. Cl. C07g *7/00*
U.S. Cl. 195—2 **11 Claims**

This document discloses a method for purification, including concentration, of certain enzyme inhibitors. The inhibitors are sorbed from their aqueous solutions by an insoluble material which is a combination of a polymeric substance and an enzyme, and subsequently are desorbed.

3,630,842

PRODUCTION OF 3',5'-CYCLIC ADENYLIC ACID WITH MICRO-ORGANISMS

Jiro Ishiyama, Noda-shi; Tamotsu Yokotsuka, and Nobuo Saito, both of Nagareyama-shi, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda-shi, Japan

Filed May 13, 1969, Ser. No. 824,265
Aug. 10, 1968, Japan, 43/72863
Claims priority, application Japan, Aug. 9, 1968, 43/56138
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 N **8 Claims**

A better and more practical fermentation method was sought out to produce a biochemically valuable compound, 3',5'-cyclic adenylic acid, from adenosine, adenine, inosine, hypoxanthine, 5-amino-4-imidazolecarboxamide-riboside, 5-amino-4-imidazolecarboxamide, succinyl adenosine, and succinyl adenine, by cultivating aerobically under suitable conditions a strain of micro-organisms belonging to one of *Corynebacterium murisepticum* No. 7 (ATCC 21374), a new species of *Arthrobacter*, No. 11 (ATCC 21375) and a new species of *Microbacterium*, No. 205 (ATCC 21376), and being capable of producing said acid from the above-named compounds, in a medium which contains, other than at least one of said compounds, suitable carbon sources, nitrogen sources and other inorganic substances. Then, 3',5'-cyclic adenylic acid thus formed and accumulated in said medium was further purified by means of charcoal and appropriate ion exchange resins and the like.

3,630,843

PROCESS FOR TREATING A HYDROCARBON FERMENTATION LIQUOR

Akira Furuya; Yoshiatsu Aoki, both of Machida-shi, and Mikio Takayanagi, Hofu-shi, all of Japan, assignors to Kyowa Hakko Kogyo, Ltd., Tokyo, Japan

Filed July 17, 1968, Ser. No. 745,356
Claims priority, application Japan, July 19, 1967, 42/46099
Int. Cl. C12b *1/26*
U.S. Cl. 195—28 R **12 Claims**

The present disclosure is directed to a process for treating a hydrocarbon-containing fermentation liquor obtained by culturing the hydrocarbon assimilating micro-organism in a fermentation liquor containing a hydrocarbon as the main carbon source, to separate the hydrocarbon remaining after fermentation and the micro-organism cells from said liquor, which comprises generating microfine air bubbles in the lower portion of the fermentation liquor, thereby causing the hydrocarbon and micro-organism cells to rise to the upper portion of said fermentation liquor, and thereby separating the fermentation liquor into the hydrocarbon-micro-organism cell phase and the water phase.

3,630,844

STARCH CONVERSION SYRUPS

Thomas L. Hurst; Roy F. Larson, and Almerin W. Turner, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 26, 1968, Ser. No. 755,094
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 **16 Claims**

A method and composition for producing starch conversion syrups having a minimum F. E. value of 77 percent, a minimum D. E. value of about 68 percent and a maximum D. content of 47 percent by saccharifying a starch hydrolyzate with an enzyme composition comprising a diastase, glucoamylase and amylo-1,6-glucosidase.

3,630,845

PROCESS FOR PREPARING DEXTROSE CONTAINING SYRUPS

Robert G. Dworschack, and Carolyn A. Nelson, both of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed Oct. 7, 1968, Ser. No. 765,642
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 **10 Claims**

The invention is directed to a process for preparing dextrose containing syrups having a predictable dextrose content. During enzymatic hydrolysis of starch to dextrose, ClO_2 is incorporated into the hydrolysate to inactivate the enzyme when the dextrose content of the hydrolysate reaches a predetermined level.

3,630,846

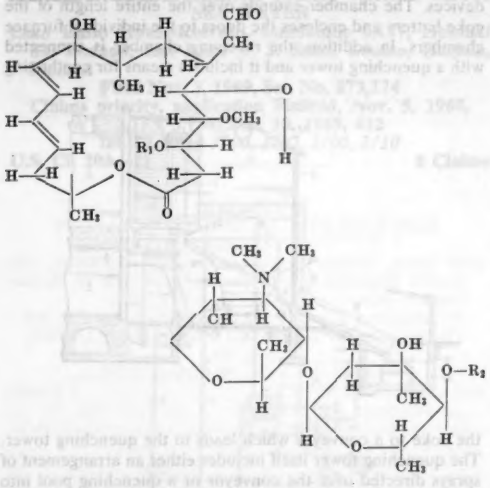
ANTIBIOTIC PRODUCTION USING STREPTOMYCES KITASATOENSIS

Toju Hata; Akihiro Matsumae; Satoshi Omura, all of Tokyo; Jinnosuke Abe, Takata-gun, and Tetsuo Watanabe, Tokyo, all of Japan, assignors to The Kitasato Institute and Toyo Jozo Kabushiki Kaisha

Original application Sept. 1, 1967, Ser. No. 665,059, now Patent No. 3,535,309, dated Oct. 20, 1970. Divided and this application Oct. 7, 1969, Ser. No. 871,372
Int. Cl. C12d *9/00*
U.S. Cl. 195—80 **8 Claims**

Manufacture of new antibiotic substances by the cultivation of a micro-organism belonging to Streptomyces

kitasatoensis. The antibiotic of the invention has the general structural formula:



wherein when R_1 represents hydrogen, R_2 represents acetyl, propionyl, butyryl or where when R_1 represents acetyl, R_2 represents acetyl, propionyl, butyryl or isovaleryl.

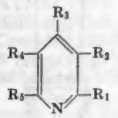
3,630,847

DIAGNOSTIC AGENT FOR USE IN THE DETERMINATION OF HYDROPEROXIDES AND OF PEROXIDATE-ACTIVE SUBSTANCES

Hans-Georg Rey; Hans Wielinger, and Peter Rieckmann, all of Mannheim-Waldhof, Germany, assignors to Boehringer Mannheim Gesellschaft mit beschraenkter Haftung, Mannheim-Waldhof, Germany

Filed July 17, 1968, Ser. No. 745,358
Claims priority, application Germany, July 20, 1967, B 93558
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.5 **13 Claims**

Diagnostic agents suitable for use in carrying out rapid analytical determinations of the presence and/or concentration of hydroperoxide substances which react with the liberation of hydrogen peroxide, peroxidase and peroxidate active substances comprising an indicator, i.e., chromogen, which is oxidized by hydrogen peroxide, peroxidase or peroxidate active substances to form a dyestuff, the color intensity of which is dependent on the peroxide, peroxidase or peroxidate active substance present in the test sample, wherein the chromogen is a compound having the formula:



in which R_1 is hydroxyl, unsubstituted or substituted amino, wherein the substituent is an aliphatic, araliphatic, cycloaliphatic, heterocyclic or aromatic radical, which in turn is substituted by one or more of hydroxy, amino and alkoxy; R_3, R_2 and R_5 are each one of hydrogen, amino, hydroxy or alkoxy and R_4 is hydrogen or the substituent R_1.

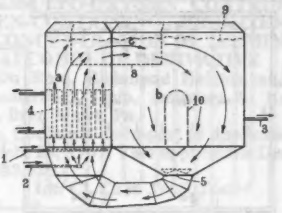
The diagnostic agents can be used for analytical determinations involving, for example, glucose, galactose, amino acids, uric acid, peroxide, hemoglobin, peroxidase, etc. in samples, for example, constituting biological fluids such as blood, urine, spinal fluid, etc., milk, cosmetic and drug formulations, etc.

3,630,848

CONTINUOUS FERMENTATION METHOD AND DEVICE

Louis Alfred Auguste Lefrancois, 24 Rue Barbet de Jouy, Paris, France

Filed Dec. 26, 1968, Ser. No. 786,930
Claims priority, application France, Dec. 29, 1967, 134358
Int. Cl. C12b *1/14, 1/16*
U.S. Cl. 195—109 **19 Claims**



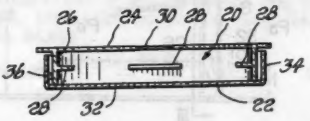
The continuous fermentation of a working liquid wherein the circulation of the working liquid takes place through two chambers in succession, the entire mass being involved in the general flow, said chambers having unequal useful horizontal cross sections, the whole or the greater part of the gas by which the circulation is obtained being blown in the vicinity of the bottom of the ascending portion of the circuit which has the smallest cross-sectional area, said mass being subsequently transferred at a lower flow rate into the descending flow chamber having a greater cross-sectional area, whereby the ratio of the times of the ascending and descending movements of said mass considered as having a uniform mean density, ranges from 0.8 to 0.05.

3,630,849

SURFACE MICRO-ORGANISM CONTAMINATION ASSAYS

David B. Land, Horace Harding Expressway, Flushing, N.Y., and Stephen L. Bazil, 25 Catalpa Lane, Valley Stream, N.Y.

Filed Apr. 24, 1969, Ser. No. 820,040
Int. Cl. C12k *1/00*
U.S. Cl. 195—139 **8 Claims**



A receptacle and lid combination for molding solidified nutrient containing agar-agar with a flat face coplanar with the rim of the receptacle and keyed in the receptacle to resist withdrawal, for micro-organism contamination assays. The lid is formed with a flat base inside and the height of the circular wall on the receptacle is greater than the height of the circular wall on the lid to permit the receptacle to seat against the base of the lid and where the receptacle is formed with a vent and the lid is formed with projections from the wall near the base for a force fit with the receptacle.

3,630,850

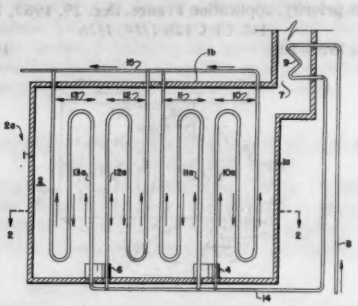
CRACKING FURNACE WITH BURNERS ENGAGING MIRROR IMAGE COILED TUBES

Wilhelmus R. Dorresteyn, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed Aug. 4, 1969, Ser. No. 847,285
Claims priority, application Netherlands, Dec. 2, 1968, 6817224
Int. Cl. C10g *9/20*
U.S. Cl. 196—110 **12 Claims**

A cracking furnace for carrying out chemical reactions wherein the furnace is a closed chamber having a top bottom and at least two relatively smooth vertical parallel walls. A plurality of vertically extending hollow tubes for carrying a

medium therethrough are disposed in the chamber, an odd number of the tubes forming a coil with all of the tubes in one coil being joined to adjacent tubes in the same coil. The coils include inlet and outlet openings, the inlet openings being on one side of the chamber and the outlet openings on



the other. At least two coils are adjacent in such a manner that one is the mirror image of the other. Burner means operatively engages the inlet openings and a combustion gas outlet in the chamber is in communication with the outlet openings.

3,630,851

PERFORATED WEIR IN FLASH DISTILLATION

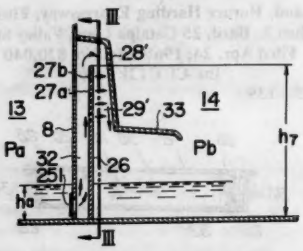
Yoshito Kawaguchi, and Kenkichi Izumi, both of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 29, 1969, Ser. No. 845,788

Claims priority, application Japan, July 29, 1968, 43/52965

Int. Cl. B01d *3/06*

U.S. Cl. 202—173 **11 Claims**



A flash evaporator having a plurality of adjacent rectangular flash chambers defined by partition walls and arranged in a straight line horizontally, each of said rectangular flash chambers being provided with flash means comprising an orifice provided at the lower part of each of said partition walls for introducing brine thereinto, a weir having at least one hole therein and being set a proper distance apart from each of said partition walls, and a baffle-board provided so as to cover said weir at a proper distance therefrom, whereby the brine is effectively evaporated in the flash chamber by being fully mixed and agitated by said flash means.

3,630,852

POLLUTION-FREE DISCHARGING AND QUENCHING APPARATUS

Gerd Nashan, Oberhausen-Sterkrade-Nord, and Johannes Knappstein, Recklinghausen, both of Germany, assignors to Firma Carl Still, Recklinghausen, Germany

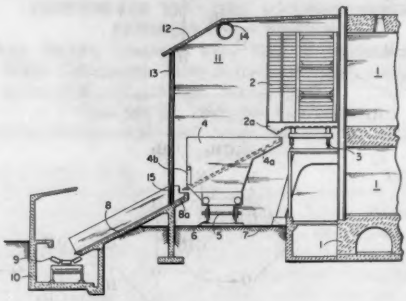
Filed July 18, 1969, Ser. No. 843,084

Claims priority, application Germany, July 20, 1968, P 17 71 855.7

Int. Cl. C10b *33/00, 39/08, 39/12*

U.S. Cl. 202—229 **10 Claims**

A device for the controlled gas-free and dust-free discharge and quenching of coke for horizontally arranged coke furnace batteries includes a closed coke-receiving chamber which is provided with gas and dust exhaust devices. The chamber extends over the entire length of the coke battery and encloses the doors to the individual furnace chambers. In addition, the receiving chamber is connected with a quenching tower and it includes means for conducting



the coke to a conveyor which leads to the quenching tower. The quenching tower itself includes either an arrangement of sprays directed over the conveyor or a quenching pool into which the coke is delivered and which includes a means for conveying the quenched coal into a receiving bin at the exterior of the quenching tower.

3,630,853

COKE OVEN DOOR WITH FLUID PRESSURE LATCHING MEANS

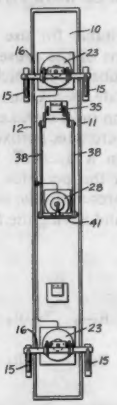
Walter Grumm, Niederelfringhausen, Germany, assignor to Dr. C. Otto & Comp. Gesellschaft mit beschrankter Haftung, Bochum, Germany

Filed Nov. 19, 1969, Ser. No. 878,035

Claims priority, application Germany, Nov. 20, 1968, P 18 09 880.1

Int. Cl. C10b *25/02*

U.S. Cl. 202—248 **2 Claims**



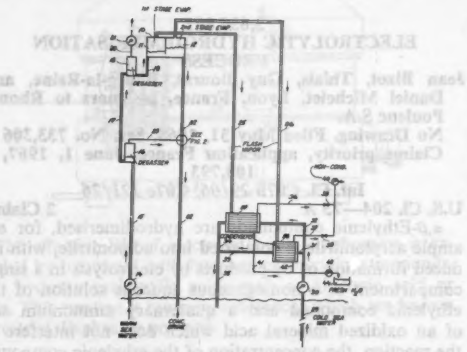
A coke oven door which has upper and lower fluid filled diaphragm means acting on door latches and also has intermediate fluid filled diaphragm means continuously communicating with said upper and lower diaphragm means and normally subjected to pressure by a force while means associated with said door are provided which in response to a limited upward movement of a lifter hook movably connected to said door automatically causes said force to reduce the pressure exerted thereby upon said second diaphragm means and thereby upon said first diaphragm means so that the door latches are relieved for permitting lifting the door off the oven frame.

3,630,854

METHOD OF DISTILLING FRESH WATER FROM SEA WATER

Esko Ensio Huhta-Koivisto, Lumikintie 6A77, Helsinki 82, Finland, and Risto V. J. Saari, Luoma, Harjula, Finland

Filed Nov. 3, 1969, Ser. No. 873,174
Claims priority, application Finland, Nov. 5, 1968, 3,153, 3,154; Feb. 10, 1969, 412
Int. Cl. B01d *3/00, 3/02, 3/06, 3/10*
U.S. Cl. 203—11 6 Claims



A continuous flow of warm sea water, e.g. surface water, is fed upwards from a supply of the warm water through a column to degassers positioned at different levels. The warm water is fed from the lowest to the highest degasser, in which gradually decreasing partial pressures, substantially higher than the partial pressures of the warm water, are established. The non-condensable gases released in the degassers are removed and the warm water is raised further through the column to evaporators through which the warm water is passed in turn. In the evaporators, gradually decreasing pressures corresponding to the gradually decreasing partial pressure of the water vapour therein, are maintained. The waste water from the last evaporator is returned to the sea downwards through another column and the vapours from each evaporator are conducted downwards separately to a corresponding condenser operated by the indirect heat exchange using a continuous stream of cold sea water obtained from the sea. Residual non-condensable gasses released on the vapourization of the warm water are removed from the condensers and the fresh water is collected from the condensers.

3,630,855

PROCESS FOR REMOVING NAPHTHALENE FROM PHENOL BY EXTRACTIVE DISTILLATION

Kenneth L. Turbin, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 4, 1970, Ser. No. 34,528
Int. Cl. B01d *3/40;* C07c *39/04*
U.S. Cl. 203—63 9 Claims

Naphthalene is removed from phenol by extractive distillation in the presence of a polyphenyl or polyphenyl ether.

3,630,856

ELECTRODEPOSITION OF RUTHENIUM

Andre Meyer, Geneva, Switzerland, assignor to Sel-Rex Corporation, Nutley, N.J.

No Drawing. Filed Mar. 20, 1970, Ser. No. 21,533
Claims priority, application Switzerland, Mar. 21, 1969, 4,277/69
Int. Cl. C23b *5/32*
U.S. Cl. 204—43 2 Claims

Thick electrodeposits of ruthenium can be obtained by adding an element selected from gallium, indium, and thallium in a stable and soluble form. The deposits obtained are primarily characterized by their low stress and absence of surface cracks at thicknesses up to about 10 millimicrons.

3,630,857

BRIGHT NICKEL ELECTROPLATING BATH CONTAINING SULFO-OXYGEN CONTROL AGENT, NITROGEN-CONTAINING BRIGHTENER AND MINOR CONCENTRATION OF TERMINAL ACETYLENIC ALCOHOL OR DERIVATIVE

Arthur H. Du Rose, Richmond Heights, and James K. Long, Chesterland, Ohio, assignors to Kewanee Oil Company, Bryn Mawr, Pa.

No Drawing. Continuation-in-part of application Ser. No. 619,187, Feb. 28, 1967. This application Dec. 29, 1969, Ser. No. 888,820
Int. Cl. C23b *5/08, 5/46*
U.S. Cl. 204—49 5 Claims

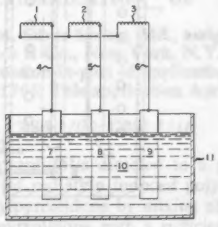
This invention comprises an improvement in a bright nickel plating bath in which previously troublesome plating at current densities of less than 8 a.s.f. or even under 15 a.s.f. is avoided by using a combination of additives comprising (a) a sulfo-oxygen control agent, (b) a nitrogen-containing brightener, namely an aromatic monoamine or aromatic polyamine, an unsubstituted polyethylenepolyamine or a nitrile, and (c) from 0.0005 to 0.1 gram per liter of an acetylenic alcohol having the formula $HC{\equiv}C{-}R$ in which R is a hydroxy-substituted hydrocarbon radical having 1–8 carbon atoms therein selected from the class consisting of hydroxy-substituted alkyl, alkenyl and cycloalkyl groups and the alkylene oxide adducts thereof containing no more than 4 alkylene oxide groups and the alkylene group therein having 1–4 carbon atoms.

3,630,858

A.C. ELECTROLYTIC PROCESS

James B. Ganci and Philip Manos, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 774,765, Nov. 12, 1968. This application Aug. 24, 1970, Ser. No. 66,654
Int. Cl. B01k *3/00*
U.S. Cl. 204—59 18 Claims



A process for preparing organometallic compounds of the formula $R_yR'_{n-y}M$ where R and R′ are alkyl, alkenyl or aryl of about 1–12 carbons and may be the same or different, M is a metal from Groups II–B, IV–A or V–A, *n* corresponds to the valence of M and *y* is a number from 0 to 4, including passing an electrolyzing alternating current through an electrolyte solution between electrodes of metal M, the solution containing a hydrocarbyl Grignard reagent RMgX, where X is a halide other than fluoride, in an inert organic solvent for the reagent, the solution further containing about 0.2–

2.0 moles/mole of RMgX of a compound R'X', where X' is a halide, other than fluoride, or lower alkyl-sulfate; and recovering $R_yR'_{n-y}M$. Uses of such products include use as gasoline antiknock components.

3,630,859

ELECTROLYTIC CELL BATH COMPOSITION FOR PRODUCTION OF MAGNESIUM

James G. Macey, Salt Lake City, Utah, assignor to Pete Prestininzi, Long Beach, Calif., and Ruth G. Macey and Anne M. Macey, with rights of survivorship, fractional part interest to each

No Drawing. Filed Feb. 16, 1970, Ser. No. 11,832
Int. Cl. C22d *3/08*
U.S. Cl. 204—70 7 Claims

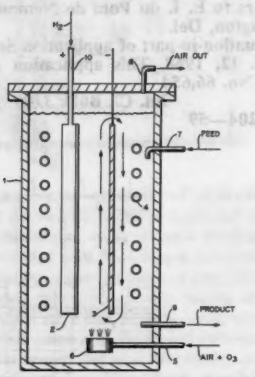
An electrolytic cell bath composition for production of molten magnesium contains about 6–36.5 percent, by weight, of magnesium chloride with essentially the remainder being lithium chloride and barium chloride in a weight ratio to each other sufficient to provide the composition with improved electrical conductivity and a specific gravity high enough to cause molten magnesium formed therein during electrolysis to float thereon. A weight ratio of barium chloride to lithium chloride of at least about 1:7.5 is employed.

3,630,860

ELECTROCHEMICAL TREATMENT OF MATERIAL PRODUCED BY REACTION IN ELECTROCHEMICAL CELL

Homer M. Fox, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Feb. 5, 1970, Ser. No. 8,978
Int. Cl. C07b *29/06;* C07c *47/00, 49/00*
U.S. Cl. 204—73 R 10 Claims



A chemical reaction is conducted in an electrochemical cell to provide a material to be acted on at a cell electrode. Thus, a single step ozonolysis of a cyclic olefin within in situ electrochemical reduction to provide a dialdehyde and/or a ketone is disclosed. An electrochemical cell, the hydrogen-depolarized anode of which can be replaced by a conventional platinum, carbon, nickel, etc. anode, suitably with a diaphragm separating it from the cathode is used, having in the cell an electrolytic solvent, e.g., an alcohol such as methanol and a supporting electrolyte such as an acid, e.g., acetic acid or a salt thereof. The olefin which can be one leading to the formation of an alpha, omega-dialdehyde, e.g., cyclododecene, is fed to the cell to which air and azone are also fed into a lower part of the cell below the cathode, the air and ozone being sparged in one embodiment into the cell liquid below the electrode creating a stirring or mixing action at the cathode to which the olefin is also fed. Cooling is provided to maintain the temperature of the cell. The low concentration of ozonide in the operation is a feature of the invention to prevent degradation and other problems encountered with ozonides.

3,630,861

ELECTROLYTIC HYDRODIMERISATION PROCESS

Jean Bizot, Thiais, Guy Bourat, Bourg-la-Reine, and Daniel Michelet, Lyon, France, assignors to Rhone-Poulenc S.A.

No Drawing. Filed May 31, 1968, Ser. No. 733,306
Claims priority, application France, June 1, 1967, 108,793
Int. Cl. C07b *29/06;* C07c *121/26*
U.S. Cl. 204—73 A 2 Claims

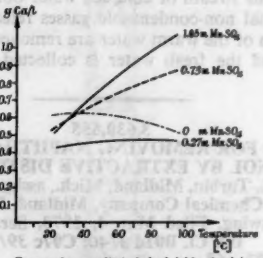
α,β-Ethylenic compounds are hydrodimerised, for example acrylonitrile is converted into adiponitrile, with reduced formation of by-products by electrolysis in a single compartment of a homogeneous aqueous solution of the ethylenic compound and a quaternary ammonium salt of an oxidized mineral acid which does not interfere in the reaction, the concentration of the ethylenic compound being 2.3 to 4.6% by weight.

3,630,862

PROCESS FOR REGENERATING ELECTROLYTIC SOLUTIONS OBTAINED IN THE ELECTROLYTIC PRODUCTION OF MANGANESE DIOXIDE

Eberhard Preisler, Knapsack, near Cologne, Kurt Grapentin, Cologne-Zollstock, and Ernst Harmsen, Lechenich, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed Feb. 16, 1970, Ser. No. 11,513
Claims priority, application Germany, Feb. 20, 1969, P 19 08 416.3
Int. Cl. B01k *1/00;* C01b *15/00*
U.S. Cl. 204—83 8 Claims



Temperature coefficient of solubility of calcium sulfate dihydrate in manganese sulfate solutions of various concentrations (m=mol/l)

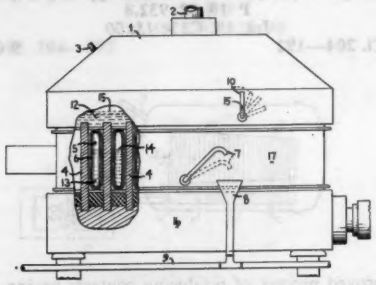
Aqueous electrolytic solutions containing manganese sulfate, calcium sulfate and sulfuric acid, obtained in the electrolytic production of manganese (IV)-oxide at elevated temperatures in electrolytic cells are regenerated. The electrolytic solution is withdrawn from the electrolytic cell, cooled down to temperatures at least 5 centigrade degrees lower than the electrolysis temperature, precipitated matter is isolated therefrom after a period of at least 15 minutes, and the solution is recycled to the electrolytic cell.

3,630,863

CELL DIAPHRAGM TREATMENT

Thomas C. Jeffery and Waylon L. White, Lake Charles, La., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 13, 1968, Ser. No. 775,426
Int. Cl. C01d *1/06*
U.S. Cl. 204—98 9 Claims



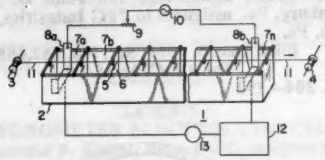
The effective life of electrolytic cell diaphragms is extended by treatment with hydroxy carboxylic compounds, e.g., hydroxy carboxylic acids such as gluconic acid or salts. This treatment removes substances which are known to restrict diaphragm porosity.

3,630,864

METHOD AND APPARATUS FOR CONTINUOUS ELECTROLYTIC POLISHING OF FINE METAL WIRES

Kiyoshi Nakamura, Chiba-shi, Koji Nabae, Yokohama-shi, and Nobuo Ohsawa, Kawasaki-shi, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki-shi, Japan

Filed June 13, 1968, Ser. No. 736,700
Claims priority, application Japan, June 19, 1967, 42/38,889; Sept. 13, 1967, 42/77,837
Int. Cl. C23b *3/06;* B01k *3/00*
U.S. Cl. 204—140.5 3 Claims



In an apparatus for effecting the continuous electrolytic polishing of fine metal wires an elongated electrolytic cell is divided into a plurality of electrolytic chambers by means of a plurality of partition walls having aligned limited openings to pass a straight wire. An electrolyte having lower resistance than the wire is circulated through the cell successively through the limited openings and chambers and alternating current is passed through the wire whereby in each chamber the current flows mainly through the electrolyte to create polarization. The apparatus is utilized in a continuous wire finishing line.

3,630,865

SEQUESTERING AGENTS AS ADDITIVES FOR ALKALI CHLORATES

Alfred O. Minklei, Kenmore, and Ronald H. Carlson, Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Jan. 22, 1968, Ser. No. 699,370
Int. Cl. B23p *1/00, 1/16*
U.S. Cl. 204—143 M 6 Claims

Certain compounds such as condensed alkali metal phosphates, aminocarboxylic acids and salts thereof, hydroxy acids and salts thereof, and organic phosphorus containing sequestering agents aid the functioning of chlorate solutions as electrolytes in electrochemical machining, milling, drilling, polishing and grinding operations.

3,630,866

CHEMICAL REACTION SYSTEM USING ULTRA HIGH FREQUENCY SONIC ENERGY

Arnold H. Pelofsky, East Brunswick, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

No Drawing. Filed July 28, 1969, Ser. No. 845,577
Int. Cl. B01j *1/12;* C07c *3/24*
U.S. Cl. 204—157.1 7 Claims

Chemical reactions, especially intra-molecular reactions, are activated by subjecting fluid reactant to ultrasonic energy in the frequency range of between about 1×10^{10} and about 1×10^{15} hertz. This is preferably accomplished by passing fluid reactant within about 2 microns of a thin layer of piezoelectric transducer material while driving said transducer material with electromagnetic radiation in the frequency range between about 1×10^{10} and about 1×10^{15} hertz. The thickness of the transducer material is usually between 0.5 and 10 microns.

3,630,867

PROCESS FOR PREPARING DICHLOROACETYL CHLORIDE

Karl Petz, Westheim, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed June 16, 1967, Ser. No. 646,500
Claims priority, application Germany, July 7, 1966, F 49,632
Int. Cl. C07c *51/58*
U.S. Cl. 204—158 HE 8 Claims

Dichloroacetyl chloride prepared by oxidizing trichloroethylene with oxygen or an oxygen-containing gas at temperatures in the range of from 15° C. to the boiling point of trichloroethylene with exposure to short-wave light, whereby the formation of by-products is avoided to a considerable extent by adding secondary or tertiary aliphatic or aromatic amines, as such or in mixture, to the reaction mixture with or without interrupting the oxidation reaction, this process being carried out continuously or discontinuously with or without pressure being applied.

3,630,868

PROCESS FOR ACCELERATING THE RADIATION INDUCED POLYMERIZATION OF N-VINYL-PYRROLIDONE

Nelson S. Marans, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 559,426, June 22, 1966. This application Apr. 23, 1969, Ser. No. 818,790
Int. Cl. C08d *1/00;* C08f *1/16*
U.S. Cl. 204—159.22 7 Claims

In abstract, this invention is directed to a process for accelerating the rate of radiation induced polymerization of monomeric N-vinylpyrrolidone by mixing about 10–90 parts of the N-vinylpyrrolidone with a sufficient quantity of a monomeric acrylamide or acrylic acid to make about 100 parts and irradiating the thus formed mixture, all as recited hereinafter.

3,630,869

PROCESS FOR ELECTRODEPOSITING METAL-SILICATE COATINGS

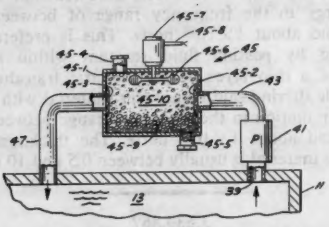
Carl Y. Man, Philadelphia, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 2, 1969, Ser. No. 881,618
Int. Cl. B01k *5/02;* C23b *13/00*
U.S. Cl. 204—181 8 Claims

The electrodeposition of silicate coatings on metal articles is the subject of this invention; aqueous disper-

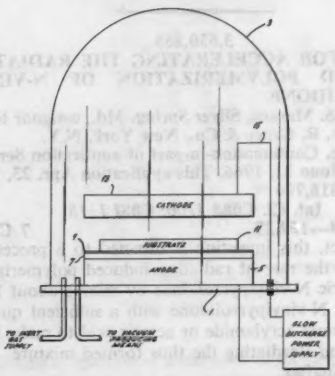
sions containing a silicate in combination with a metal, such as zinc, can be electrodeposited on metal articles to form a coating which has excellent corrosion resistance.

3,630,870
BASE CONCENTRATION CONTROL IN ELECTRODEPOSITION OF PAINT
Arthur G. Smith, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 12, 1969, Ser. No. 884,390
Int. Cl. B01k *5/02*
U.S. Cl. 204—181 **1 Claim**



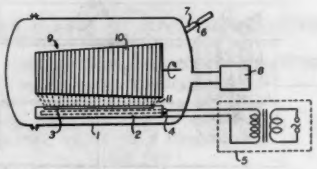
The concentration of water-soluble base in an electrocoating bath from which polycarboxylic acid resin is anodically deposited is controlled by circulating the coating bath in contact with a continuously agitated ion exchange monobed consisting essentially of a major amount of weakly acidic cation exchange resin and a minor amount of weakly basic anion exchange resin.

3,630,871
CATHODIC SPUTTERING METHOD
Sturger R. Wagner, North Palm Beach, Fla., assignor to General Instrument Corporation, Newark, N.J.
Original application July 27, 1966, Ser. No. 568,321. Divided and this application June 11, 1969, Ser. No. 840,098
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **8 Claims**



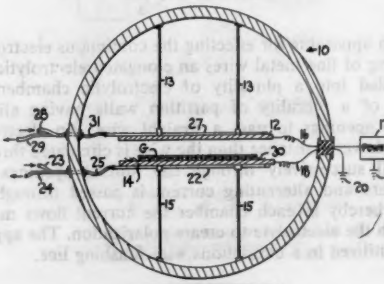
A cathodic sputtering method for depositing a thin film of cathode material on a substrate comprising the steps of positioning the substrate adjacent an anode surface coated with a material having properties similar to those of the substrate, and sputtering the substrate and the coating on the anode surface. Because of the anode coating, the anode "looks" to the cathode much like the substrate and therefore a thin film having uniform electrical resistance is produced over the entire surface of the substrate.

3,630,872
PROCESS FOR THE MANUFACTURE OF AN ELECTRICAL CONTACT POINT
Walter Reichelt, Hanau am Main, Germany, assignor to W. C. Heraeus G.m.b.H. Patentabteilung, Hanau, Germany
Filed Sept. 9, 1969, Ser. No. 856,932
Claims priority, application Germany, Oct. 14, 1968, P 18 02 932.8
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **9 Claims**



Improved process of producing contacts having a base support or substrate coated on at least part of at least one surface with a hard to form metal such as tungsten, rhenium, molybdenum, ruthenium, iridium or an alloy thereof wherein the metal coating material is provided as at least the inside surface of a cylinder and possibly also as an axial rod in the cylinder, attached to a high frequency generator which cylinder has a longitudinal slit therein, a plasma is generated by the high frequency generator which atomizes the metal and discharges such through the slit onto a suitable substrate which may be masked, if desired. The process is suitably carried out in a hermetically sealed chamber having vacuum pumping means attached thereto and gas admittance means attached thereto whereby the pressure can be regulated to 10^{-2} to 1 mm. Hg A and the atmosphere can be regulated as desired.

3,630,873
SPUTTERING OF TRANSPARENT CONDUCTIVE OXIDE FILMS
Verl D. Moore, Kittanning, and John D. Thompson, Saxonburg, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 5, 1969, Ser. No. 882,688
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **18 Claims**



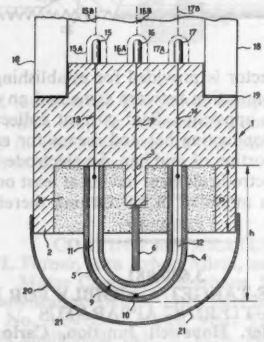
A transparent conductive oxide film may be cathode-sputtered onto glass or the like more rapidly when the glass is rested upon a water-cooled metal anode. In producing films of good conductivity, under 50 ohms per unit square, using such an anode, an undesirable patterned coating sometimes develops on the glass. The appearance is unsightly, and the pattern indicates a variation in the electrical properties of the coating. This invention minimizes and even prevents the pattern development by placing a piece of fiber-glass cloth or the like between the anode and the sample to be coated.

3,630,874

DEVICE FOR DETERMINING THE ACTIVITY OF OXYGEN IN MOLTEN METALS

Michel Olette and Christian Gatellier, St. Germain-en-Laye, France, assignors to Institut de Recherches de la Siderurgie Francaise, St. Germain-en-Laye, France

Filed Nov. 15, 1968, Ser. No. 776,175
Claims priority, application France, Nov. 17, 1967, 128,578
Int. Cl. G01n 27/46
U.S. Cl. 204—195 1 Claim



An expendable electrochemical cell for immersion into molten metal to determine the activity of oxygen therein comprise a tube of solid electrolyte which is immersed into a bath of molten metal and confines a reference substance containing oxygen whose partial pressure at various temperatures is known, and an electrode which is exposed to molten metal upon immersion of the cell. A thermocouple in the tube is surrounded by the reference substance and its branches are connected to terminals provided on a heat-resistant insulating support for the tube and electrode. The electromotive force is measured across one of the terminals and the electrode, and the temperature of molten metal is measured across the terminals.

3,630,875

HYGROMETER ELECTROLYTIC CELL

Fernand B. Kuffer, Brea, Calif., assignor to Beckman Instruments, Inc.

Filed Mar. 10, 1970, Ser. No. 18,263
Int. Cl. G01n 25/56
U.S. Cl. 204—195 15 Claims

An hygrometer electrolytic cell having as an electrolyte an anhydride formed from an acid of an element selected from the group consisting of aluminum, boron, Group IV–A elements and Group V–A elements. The acid has blocked polymerization sites and contains not more than the equivalent of 19 carbon atoms.

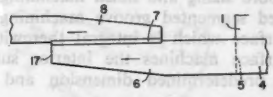
3,630,876

MERCURY SEPARATION IN MERCURY PROCESS ELECTROLYTIC APPARATUS

Hiroshi Shibata, Teruo Imai, and Shigeji Kumaki, Iwakishi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 18, 1967, Ser. No. 691,413
Claims priority, application Japan, Dec. 27, 1966, 42/85,476; Apr. 5, 1967, 42/21,226
Int. Cl. C01d 1/08
U.S. Cl. 204—219 5 Claims

A baffle plate with an outlet opening below its lower edge forms a partial side wall of a passageway through which mercury or mercury amalgam flows together with contaminants and a solution floating above it in a mercury process apparatus and only the mercury or amalgam is permitted to pass under and past the baffle into another passageway parallel to the first passageway,



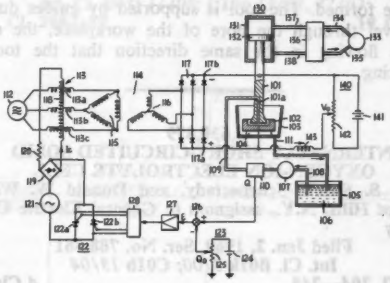
thereby being separated from the contaminants and solution, which are blocked by the baffle. The baffle along the side wall affords thorough separation without mixing due to turbulence of contaminants and solution with separated mercury or amalgam.

3,630,877

ELECTROLYTICALLY MACHINING APPARATUS

Kazushige Koike and Akio Sarai, Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 11, 1968, Ser. No. 759,158
Claims priority, application Japan, Sept. 18, 1967, 42/59,699
Int. Cl. B23p 1/02, 1/12
U.S. Cl. 204—224 7 Claims



An electromagnetic flow meter measures a flow rate of a liquid electrolyte supplied to a working gap between a workpiece and a working electrode. In order to maintain the gap constant, a machining voltage or current is controlled to have its reference magnitude while simultaneously the current or voltage is controlled to make the measured flow rate equal to its constant reference magnitude. With the electrode arranged to move toward the workpiece at a constant feed rate, the feed rate is determined so as to make the machining current density equal to its constant reference magnitude while the machining voltage is controlled to make the measured flow rate equal to its constant reference magnitude. Alternatively, the machining voltage is controlled to have its constant reference magnitude while the feed rate is controlled to make the measured flow rate equal to its reference magnitude.

3,630,878

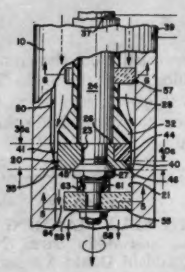
APPARATUS AND METHOD FOR FORMING GROOVES AND LANDS

William Andrew Haggerty, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 18, 1969, Ser. No. 850,805
Int. Cl. B23p 1/04; C23b 5/72
U.S. Cl. 204—225 6 Claims

An electrochemical machining apparatus for forming relatively shallow lands and grooves on the relatively

smooth interior surface bore of a tubular member, e.g., forming rifling in a gun barrel, includes a tool advanceable into the tubular workpiece while electrolyte is pumped between the tool and the interior surface of the workpiece. The outer peripheral surface of the tool includes a bore sizing and finish machining surface and an associated segmented groove machining and groove finishing surface which is integral therewith. The bore finishing surface machines the interior surface of the bore to a predetermined dimension and is followed



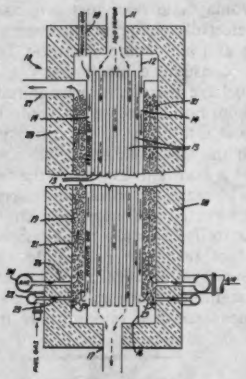
in the direction of tool travel by the segmented groove machining surface which forms grooves in the bore to a predetermined diameter greater than the predetermined bore dimension and separated by lands having a diameter equal to the predetermined bore dimension. By rotating the tool during its advancement spiral lands and grooves may be formed. The tool is supported by guides during its travel through the bore of the workpiece, the electrolyte flowing in the same direction that the tool is advancing.

3,630,879

INTERNALLY SHORT-CIRCUITED SOLID OXYGEN-ION ELECTROLYTE CELL

Henry S. Spacil, Schenectady, and Donald W. White, Burnt Hills, N.Y., assignors to General Electric Company

Filed Jan. 2, 1969, Ser. No. 788,581
Int. Cl. B01k *3/00*; C01b *13/04*
U.S. Cl. 204—248 **4 Claims**



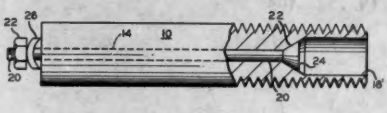
A tubular leadless solid oxygen-ion electrolyte cell is described employing as the electrolyte an oxygen-ion material having internal short circuiting. Water vapor is admitted to the cathode, where it is dissociated to yield hydrogen, while at the anode a reducing gas flow is supplied at a rate in excess of that required to combine with the oxygen emerging therefrom whereby to render the cell self-driven.

3,630,880

CURRENT COLLECTOR AND ELECTRODE ASSEMBLY

Murl B. Howard, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 23, 1968, Ser. No. 785,960
Int. Cl. B01k *3/04*
U.S. Cl. 204—286 **9 Claims**



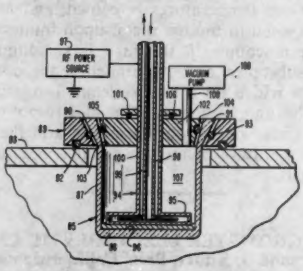
A current collector is provided for establishing an efficient electrical connection between same and an electrode in an electrolytic apparatus. Said current collector comprises a current-conducting bar and means for expanding at least one end portion of said bar. An electrode assembly comprising an electrode element having at least one of said current collectors mounted in an opening therein is also provided.

3,630,881

CATHODE-TARGET ASSEMBLY FOR RF SPUTTERING APPARATUS

William C. Lester, Hopewell Junction, Carlo Nuccio, Poughkeepsie, and Ernest S. Ward, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1970, Ser. No. 4,891
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **34 Claims**



A target of a dielectric material is mounted in spaced relation to a cathode, which is isolated from the sputtering chamber and the anode in the sputtering chamber by the target and its mounting structure. RF energy is transferred from the cathode to the target, which has at least a portion parallel to the anode, through the space by a dielectric coolant, a liquid metal, or a metallic paste. When either the metallic paste or the liquid metal is employed, the cathode is cooled by circulating a coolant such as water therethrough.

3,630,882

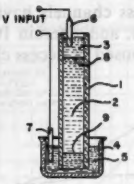
APPARATUS FOR PARTICLE SEPARATION

Robert H. Dilworth III, Knoxville, Tenn., assignor to Ortec, Incorporated, Oak Ridge, Tenn.

Filed June 13, 1968, Ser. No. 736,642
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 **8 Claims**

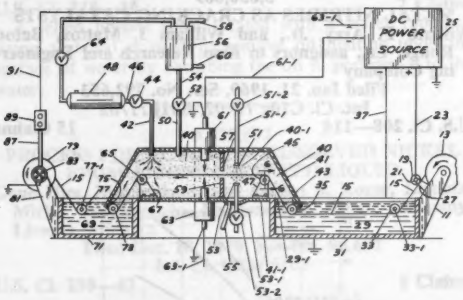
A mixture of particles in a suspending medium is subjected to an intermittent DC electrical field of strength which is sufficient to produce a sharp separation of two or more components of the mixture. The duty cycle of the field is such that electric power dissipation in the mix-

ture produced by the intermittent DC electric field does not materially cause loss of sharpness of separation of the components, and the application of the intermittent DC electric field is regulated in such a way as to produce



a selected low average DC power dissipation in the mixture and which may be substantially constant in spite of variations in the impedance of the mixture throughout the period of the separation.

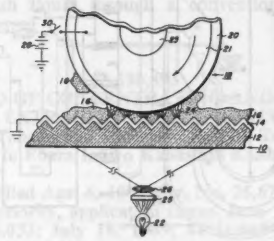
3,630,883
COATING APPARATUS
Allen H. Turner, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Original application Oct. 3, 1966, Ser. No. 583,834, now Patent No. 3,501,390, dated Mar. 17, 1970. Divided and this application Feb. 9, 1970, Ser. No. 9,816
Int. Cl. B01k *5/02;* **C23b** *13/00*
U.S. Cl. 204—300 **2 Claims**



Apparatus for coating electrically conductive objects comprises in combination bath retention means, a housing forming an enclosed irradiation zone adjacent to and extending over and into said bath retention means, inlet means into said irradiation zone through which an inert gas can be introduced into said zone, a first electrode within said bath retention means, electrical supply means to provide a difference of potential between the object to be coated and said first electrode, conveyor means for transporting said object through said coating bath and into said irradiation zone, and electron emission means for irradiating said object in said irradiation zone.

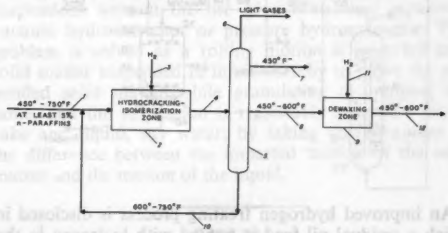
3,630,884
TRANSPARENT ELECTRODE IMAGING IMPROVEMENT
Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed May 2, 1969, Ser. No. 821,369
Int. Cl. B01k *5/00*
U.S. Cl. 204—300 **7 Claims**

Apparatus for improved imaging and for eliminating corona arcing in an electrophoretic imaging system employing a transparent electrode having electrically conductive transparent portions causing variations in the surface potential of the electrode under the influence of an electrical field. The electrode functions within an imaging



system also having a means to illuminate the conductive portions for forming an image in a confined electrical field in a manner preventing corona arcing between electrodes of the imaging system.

3,630,885
PROCESS FOR PRODUCING HIGH YIELDS OF LOW FREEZE POINT JET FUEL
Clark J. Egan, Piedmont, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Sept. 9, 1969, Ser. No. 856,304
Int. Cl. B01j *11/08;* **C10g** *13/02, 37/02*
U.S. Cl. 208—59 **10 Claims**

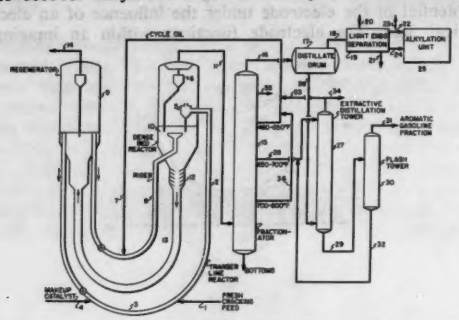


Process for obtaining a high yield of low freeze point jet fuel from a hydrocarbon feedstock containing materials boiling above the jet fuel boiling range and containing at least 5 volume percent normal paraffins which comprises subjecting said feedstock to hydrocracking and isomerization in the presence of hydrogen and a catalyst comprising alumina, a halogen and a component selected from the metals platinum, palladium and iridium and compounds of said metals, whereby the amount of jet fuel boiling range materials is increased and normal paraffins are isomerized, and selectively hydrocracking the remaining normal paraffins in the presence of hydrogen and a catalyst comprising mordenite in hydrogen form and at least one hydrogenating component.

3,630,886
PROCESS FOR THE PREPARATION OF HIGH OCTANE GASOLINE FRACTIONS
Donald W. Deed, Millburn, and Terence K. Kett, Boonton, N.J., assignors to Esso Research and Engineering Company
Filed Mar. 26, 1970, Ser. No. 22,841
Int. Cl. C10g *37/06*
U.S. Cl. 208—96 **10 Claims**

High octane gasoline fractions are produced in a process comprising segregated cracking of virgin and recycle

stocks coupled with distillation and extractive distillation to recover alkylation feedstock components and a high



octane monocyclic aromatic petroleum fraction suitable for gasoline blending.

3,630,887

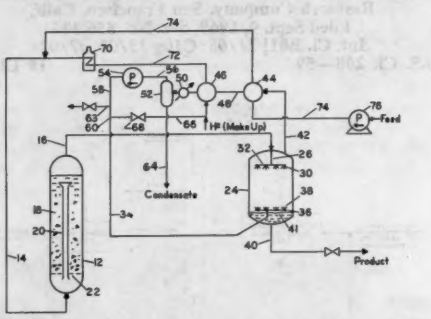
RESIDUAL OIL HYDROGEN TREATING PROCESS

William R. Mounce, Cranbury and Roger P. Van Driesen, Hopewell, N.J., assignors to Cities Service Research and Development Company, New York, N.Y.

Filed Feb. 5, 1970, Ser. No. 8,857

Int. Cl. C10g *13/02*

U.S. Cl. 208—100 **3 Claims**



An improved hydrogen treating process is disclosed in which a residual oil feed is treated with hydrogen in the presence of an ebullated catalyst bed at temperatures in a reactor between 800° F. and 900° F. and pressures between 2000 and 3000 p.s.i. The reactor effluent stream is cooled by spraying it down through an upwardly rising stream of cool recirculating hydrogen-rich gas resulting in transfer of heat to the gas and recovery of hydrogen from the effluent. The recirculating gas and recovered hydrogen is cooled by the incoming oil feed and additionally cooled before being pressurized to reactor pressure, and an aliquot portion of the cooled pressurized gas recirculated as coolant for the effluent, the remainder being recycled to the reactor with the feed.

3,630,888

HYDROCRACKING AND DESULFURIZATION WITH A CATALYST HAVING MICROPORES AND ACCESS CHANNELS

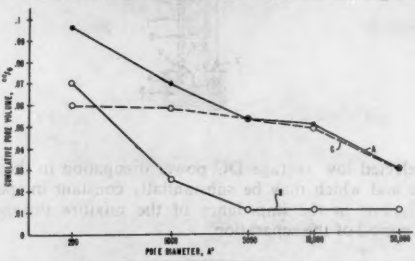
Seymour B. Alpert, Princeton, Ronald H. Wolk, Lawrence Township, and Peter Maruhnic and Michael C. Chervenak, Pennington, N.J., assignors to Hydrocarbon Research, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 678,727, Oct. 27, 1967. This application Mar. 2, 1970, Ser. No. 15,815

Int. Cl. C10g *23/02, 13/02*

U.S. Cl. 208—109 **8 Claims**

A process for carrying out catalytic reactions, such as, hydrogenation, desulfurization, hydrocracking, including halogenation, oxidation, sulfonation, nitration and amidization of hydrocarbons or the like in fixed, slurried, fluidized and ebullated beds utilizing a catalyst having micropores and access channels; and wherein the access channels are interstitially spaced throughout the micropores; and wherein 10 to 40% of the total pore volume is composed of access channels having diameters greater than 1000 angstroms; and wherein 10 to 40% of the total pore volume is composed of access channels having diam-



eters between about 100 and 1000 angstroms; and wherein these access channels are substantially uniform as to their parameters and are relatively straight with minimum bending and constrictions; and wherein the remainder of the catalyst pore volume comprises micropores with diameters less than 100 angstroms with the remainder being 20 to 80% of the total pore volume. Methods for preparing this catalyst with respect to orientation of the access channels are described.

3,630,889

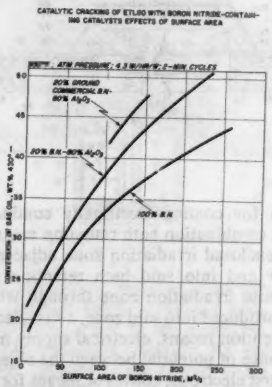
METAL NITRIDES AS CRACKING CATALYSTS

William F. Arey, Jr., and William J. Mattox, Baton Rouge, La., assignors to Esso Research and Engineering Company

Filed Jan. 21, 1969, Ser. No. 792,653

Int. Cl. C10g *11/02*; B01j *11/82*

U.S. Cl. 208—114 **15 Claims**



A cracking catalyst consists essentially of a nitride of aluminum, boron, or silicon, supported or not, on alumina or alumina/silica, titania, zirconia and the like.

3,630,890

OPERATION OF ADSORPTION SYSTEMS

Norman L. Carr, Allison Park, and Harry C. Stauffer, Cheswick, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

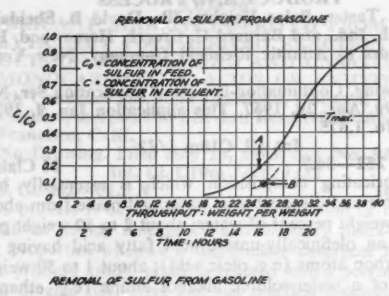
Filed Nov. 7, 1969, Ser. No. 874,924

Int. Cl. C10g *17/08*; B01d *53/04*

U.S. Cl. 208—208 **19 Claims**

The operation of an adsorption system for the removal of at least one component from a fluid material with a

porous adsorbent is improved by interrupting flow of the fluid feed over the porous adsorbent at the time or before the concentration in the effluent of component material to be removed or the concentration of component material on the adsorbent reaches a predetermined value, and subsequently restarting the flow of fluid feed over the adsorbent.



REMOVAL OF SULFUR FROM GASOLINE

3,630,891
METHOD OF REMOVING OIL FROM THE SURFACE OF WATER

Kenneth S. Peterson and George R. Palkie, Cloquet, Minn., assignors to Conwed Corporation, St. Paul, Minn.

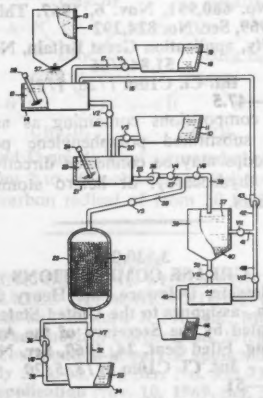
No Drawing. Filed Feb. 28, 1969, Ser. No. 803,406
Int. Cl. B01d *15/00*
U.S. Cl. 210—36 **7 Claims**

A felted fibrous sheet treated with a water repellent sizing material is used to remove oil floating upon the surface of water by absorbing the oil in preference to the water.

3,630,892
PROCESS FOR REMOVING DISSOLVED NICKEL FROM A CONTAMINATED LIQUID

Gene Hirs, Birmingham, and Robert S. Kozar, Livonia, Mich., assignors to Hydromation Filter Company, Livonia, Mich.

Filed Dec. 10, 1970, Ser. No. 96,697
Int. Cl. C02c *5/02*
U.S. Cl. 210—42 **8 Claims**

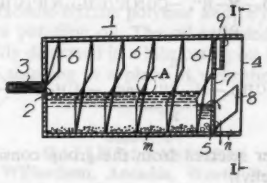


A method of removing nickel from plating rinse water or the like by upwardly adjusting the pH of an aqueous nickel solution to precipitate the nickel as a colloidal suspension, passing the precipitate suspension through a deep-bed filter having a granular, synthetic organic medium therein to deposit the nickel precipitate on the filter medium, backwashing the filter medium to remove the deposited nickel precipitate therefrom and then filtering the backwash liquid through a conventional filtration mechanism.

3,630,893
METHOD OF CONCENTRATING AND HYDRO-EXTRACTING SUSPENSIONS

Shigemasa Tanada and Hidetomo Suzuki, Tokyo, Japan, assignors to Ebara Infilco Kabushiki Kaisha, Tokyo-to, Japan

Filed Apr. 6, 1970, Ser. No. 25,679
Claims priority, application Japan, June 18, 1969, 44/48,032; July 18, 1969, 44/56,868; Sept. 8, 1969, 44/85,182
Int. Cl. B01d *21/01, 21/26*
U.S. Cl. 210—49 **5 Claims**



According to this invention, cakes can be obtained from suspensions without the use of a centrifugal separator, vacuum hydroextractor or pressure hydroextractor. This problem is solved as a rolling motion is imparted to a solid matter suspended in liquid thereby to move the suspended solid matter while granulating or lumping the same, and the suspension is reasonably separated into a cake and liquid, say water, by taking the advantage of the difference between the imparted motion of the solid matter and the motion of the liquid.

3,630,894
DETERGENT COMPOSITIONS

Christina Nicholson Lazaridis, Wilmington, Del., and Harold Eugene Wixon, New Brunswick, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed July 2, 1969, Ser. No. 838,707
Int. Cl. C11d *3/34;* **D06m** *13/28*
U.S. Cl. 252—8.7 **19 Claims**

A detergent composition which also softens textiles and which is non-yellowing and, further, does not render the textile water repellent, comprising a surface active detergent component and a *sulfolanyl (or sulfolenyl) ester of a long chain carboxylic acid.*

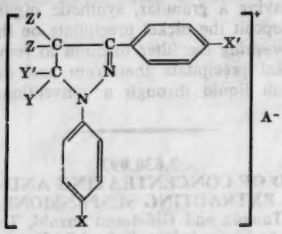
3,630,895
TEXTILE SOFTENING AND OPTICAL BRIGHTENING COMPOSITIONS

Horst-Jurgen Krause and Menfred Dohr, Dusseldorf-Holthausen, and Helmut Bloching, Hilden, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed June 26, 1969, Ser. No. 836,958
Claims priority, application Germany, July 2, 1968, P 17 69 718.6
Int. Cl. C09k *1/02;* **D06m** *13/34*
U.S. Cl. 252—8.75 **8 Claims**

Textile softening and optical brightening compositions comprising a content of a water-dispersible salt of a surface-active ammonium compound and a content of a

water-dispersible cationic optical brightener having the formula:

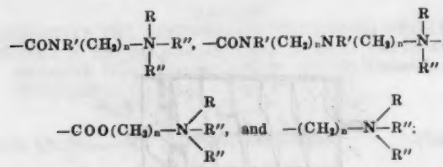


wherein:

X is a member selected from the group consisting of $-SO_2NH_2$, $-SO_2R$, $-SO_2-OR$, $-COOR$, $-CONH_2$, $-CN$, $-CF_3$, halogen, $-OR$, and R;

X′ is a member selected from the group consisting of halogen, $-OR$ and $-R$;

Y is a member selected from the group consisting of:



Y′ is a member selected from the group consisting of H, —R and phenyl;

Z is a member selected from the group consisting of H and Y;

Z′ is a member selected from the group consisting of H and R;

R is alkyl having 1 to 4 carbon atoms;

R′ is a member selected from the group consisting of H and R;

R″ is a member selected from the group consisting of R and $-(CH_2)_{n-1}-CH_2OH$;

n is an integer from 2 to 4; and

A^- is an anion of an acid.

3,630,896

AGRICULTURAL CHEMICAL COMPOSITION IN SOLID OR JELLY FORM

Hideto Oka, 275–1 Karasawa, Fujisawa-shi, Kanagawa, Japan, and Eiichiro Nakatsuka, 23–15 Kohinata 1-chome, Bunkyo-ku, Tokyo, Japan

No Drawing. Filed July 11, 1969, Ser. No. 841,150
Claims priority, application Japan, July 12, 1968, 43/48,724
Int. Cl. A01n *9/00*; B01j *13/00*; C09k *3/00*
U.S. Cl. 252—1 **1 Claim**

The present invention relates to an agricultural chemical solidified or jellied by adding an appropriate amount of dibenzalsorbitol, monobenzalsorbitol or tribenzalsorbitol to an organic agricultural chemical which is liquid, as it is, or in a liquid state by dissolving said chemical in a solvent. The agricultural chemical may be a germicide, nematocide, insecticide or herbicide.

3,630,897

COLOR STABILIZATION OF LUBRICATING COMPOSITIONS

Raymond Rohde and Andrew E. Skeen, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Oct. 6, 1969, Ser. No. 864,210
Int. Cl. C10m *1/32, 1/38*
U.S. Cl. 252—33.6 **7 Claims**

The darkening and discoloration of lubricating greases and oils induced by the use of metal salts of substituted dithiocarbamic acid are effectively prevented by the inclusion of small amounts of poly(phenylene sulfide) in the lubricating composition.

3,630,898

PRODUCT AND PROCESS

Ford C. Teeter, Palos Heights, Ill., David B. Sheldahl, Griffith, Ind., and Barnard C. Creech, Homewood, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 632,190, Apr. 20, 1967. This application Jan. 9, 1970, Ser. No. 1,875
Int. Cl. C10m *1/32*
U.S. Cl. 252—34.7 **24 Claims**

A lubricating composition which is essentially biodegradable and dispersible in water and made from about 1 to 77 weight percent of water; about 2 to 50 weight percent of an olefinically-unsaturated fatty acid having 10 to 32 carbon atoms (e.g. oleic acid); about 1 to 50 weight percent of a water-soluble alkanol amine (e.g. ethanolamine); about 0 to 90 weight percent of an alcohol (e.g. ethylene glycol); and about 1 to 30 weight percent of an ester of a polyethylene glycol and an olefinically-unsaturated fatty acid having 10 to 32 carbon atoms (e.g. a monoleate of a polyethylene glycol of about 400 molecular weight).

3,630,899

LUBRICATING METHOD FOR CONTINUOUS CASTING

Peter J. Koenig, Zumikon, Switzerland, assignor to Concast Aktiengesellschaft, Zurich, Switzerland

No Drawing. Filed Mar. 21, 1969, Ser. No. 809,387
Claims priority, application Switzerland, Mar. 25, 1968, 4,395/68
Int. Cl. C10m *1/26*
U.S. Cl. 252—37 **6 Claims**

A method of lubricating continuous castings of metals, particularly steel, which comprises introducing into the continuous-casting mold during casting a lubricant consisting of a lubricating oil, such as rape oil, in which additives are incorporated for increasing the proportion of carbon-containing constituents in the residues formed in the mold by pyrolytic decomposition.

3,630,900

LUBRICANT COMPOSITIONS

Henricus G. P. van der Voort, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 680,991, Nov. 6, 1967. This application May 13, 1969, Ser. No. 824,292
Claims priority, application Great Britain, Nov. 18, 1966, 51,844/66
Int. Cl. C10m *1/28, 1/38*
U.S. Cl. 252—47.5 **13 Claims**

Lubricant compositions containing as an additive a linear alkyl substituted polyphenylene polymer. The phenylene groups may be connected directly together or separated by hydrocarbyl or hetero atoms, e.g., polyphenylene ethers.

3,630,901

GREASE COMPOSITIONS

Joseph F. Messina, Delaware, and Henry Gisser, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Sept. 24, 1969, Ser. No. 860,797
Int. Cl. C10m *5/18, 5/20*
U.S. Cl. 252—51 **8 Claims**

Stable grease compositions having excellent extreme pressure properties, among others, the greases consisting of about 66.5 to 75.8 weight percent petroleum fluids having pour points ranging between —7.0 to —40.0° C., 0.5

weight percent phenyl-1-naphthylamine, the balance being tetrafluoroethylene polymer having a molecular weight of 10,000–50,000, a softening point of 321.1° C., a particle size less than 30 microns in diameter, and supplied as a 7.5% suspension in trichlorotrifluoroethane.

3,630,902

LUBRICANT ADDITIVES DERIVED FROM CATALYTICALLY POLYMERIZED REACTION PRODUCTS OF SUCCINIMIDES AND UNSATURATED MONOCARBOXYLIC ACIDS OR ANHYDRIDES

Keith Coupland and John Crawford, Hornsea, E. Yorks, England, assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed July 23, 1969, Ser. No. 844,161
Int. Cl. C10m *1/20, 1/32*
U.S. Cl. 252—51.5 A **10 Claims**

A process is described for the preparation of lubricant additives having detergency and viscosity index-improving properties wherein a succinimide detergent having a free primary amino group is reacted with a polymerizable acid or acid derivative and the reaction product polymerized. A further polymerization with a copolymerizable monomer is also described.

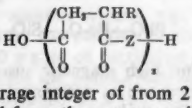
3,630,903

LUBRICANT CONTAINING POLYMERIC PRODUCTS OF ALKENYL SUCCINIC ANHYDRIDE AND A PIPERIDINE DERIVATIVE

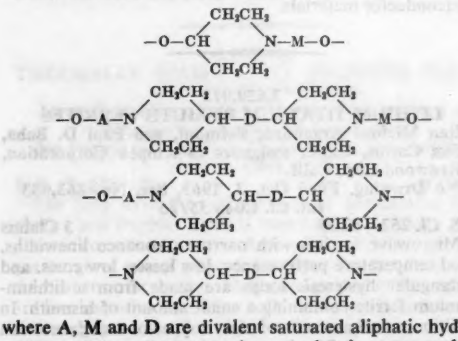
Walter W. Hellmuth, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Aug. 7, 1969, Ser. No. 848,323
Int. Cl. C10m *1/20, 1/32*
U.S. Cl. 252—51.5 A **14 Claims**

A lubricating composition containing as a dispersant between about 0.1 and 80 wt. percent of a polymeric alkenyl succinic anhydride-piperidine derivative characterized the formula:



where x is an average integer of from 2 to 100 and Z is a member selected from the group consisting of



where A, M and D are divalent saturated aliphatic hydrocarbons of from 2 to 10 carbons, and R is a monovalent alkenyl hydrocarbon radical of from 30 to 200 carbons.

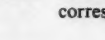
3,630,904

LUBRICATING OILS AND FUELS CONTAINING ACYLATED NITROGEN ADDITIVES

Jerry L. Musser and Edward J. Friihauf, Mentor, Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Continuation-in-part of applications Ser. No. 742,133, July 3, 1968, and Ser. No. 851,736, Aug. 18, 1969. This application Nov. 10, 1969, Ser. No. 875,580
Int. Cl. C10m *1/20, 1/32;* **C10l** *1/22*
U.S. Cl. 252—51.5 A **30 Claims**

Compositions of matter particularly useful as lubricant and fuel additives prepared by reacting various nitrogen-containing reactants with a mono- or polycarboxylic acid acylating agent containing at least about thirty aliphatic carbon atoms. The nitrogen-containing reactants are characterized by the presence of at least one N-substituent corresponding to



where r is 1–10 and R" is hydrocarbylene of up to 10 carbon atoms. An exemplary composition is one prepared by reacting polyisobutenyl succinic anhydride with the reaction product of N-(hydroxyethyl)-ethylene diamine and adipic acid.

3,630,905

OIL-EXTENDED VI IMPROVERS

Poznan M. Sorgo, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Nov. 19, 1968, Ser. No. 777,190
Int. Cl. C08d *5/00*
U.S. Cl. 260—85.1 **5 Claims**

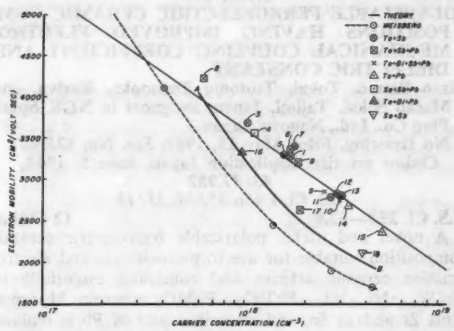
An oil-extended VI improver which by outward appearance is dry comprising (a) 40–60 weight percent hydrogenated butadiene-styrene polymer and (b) 60–40 weight percent of a paraffinc oil. The oil-extended VI improver can be readily dispersed in a lubricating oil following storage and/or shipping to a place of utilization.

3,630,906

GALLIUM ARSENIDE

Robert K. Willardson, Arcadia, Worth P. Allred, West Covina, and James E. Cook, Duarte, Calif., assignors to Bell & Howell Company

Continuation of application Ser. No. 543,604, Apr. 19, 1966. This application Oct. 2, 1969, Ser. No. 863,267
Int. Cl. C04b *35/00;* **C01b** *27/00;* **B01j** *17/00*
U.S. Cl. 252—62.3 GA **1 Claim**



Gallium arsenide having reduced lattice defect concentrations and enhanced electrical properties.

3,630,907

PIEZOELECTRIC CERAMICS

Tomeji Ohno, Masao Takahashi, Tsuneo Akashi, and Norio Tsubouchi, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Minato-ku, Tokyo, Japan

Continuation-in-part of application Ser. No. 681,494, Nov. 8, 1967. This application July 10, 1969, Ser. No. 840,788
Claims priority, application Japan, July 12, 1968, 43/49,407
The portion of the term of the patent subsequent to July 27, 1988, has been disclaimed
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 **3 Claims**

Piezoelectric ceramics are provided consisting essentially of a solid solution of $Pb(Li_{1/4}Sb_{3/4})O_3$, $PbTiO_3$ and

$PbZrO_3$ where up to 25 atom percent of Pb may be replaced by at least one of Ba, Sr and Ca, and manganese oxide in the amount of 0.10 to 3.0 weight percent in the form of MnO.

3,630,908

FERROELECTRIC AND PIEZOELECTRIC COMPOSITION

Mitsuo Osada and Osamu Kumon, Osaka, and Tatsuya Nishimoto, Hyogo, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed Mar. 11, 1968, Ser. No. 712,192
Claims priority, application Japan, Jan. 8, 1968, 43/1,030
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 **4 Claims**

Ferroelectric and piezoelectric composition comprising a solid solution of the ternary system

$$X\ (Pb(In_{1/2}Nb_{1/2})O_3)\text{-}Y\ (PbZrO_3)\text{-}Z\ (PbTiO)$$

is disclosed. The constituents are defined by the formula $X+Y+Z=100$,

wherein X, Y and Z are in the following ranges, taken with reference to the figure ABCDEFGH in FIG. 1:

	X	Y	Z
A	75	0	25
B	60	10	30
C	10	60	30
D	5	55	40
E	5	45	50
F	15	30	55
G	35	10	55
H	35	0	45

3,630,909

POLARIZABLE FERROELECTRIC CERAMIC COMPOSITIONS HAVING IMPROVED ELECTROMECHANICAL COUPLING COEFFICIENT AND DIELECTRIC CONSTANT

Hisao Banno, Tokai, Tsutomu Tsunooka, Kariya, and Masao Sakai, Tajimi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

No Drawing. Filed May 19, 1969, Ser. No. 825,947
Claims priority, application Japan, June 5, 1968, 43/37,982
Int. Cl. C46b *35/46, 35/48*
U.S. Cl. 252—62.9 **12 Claims**

A novel and useful polarizable ferroelectric ceramic composition suitable for use in piezoelectric and electrostrictive ceramic articles and consisting essentially of $Pb(W_{1/2}\cdot Ni_{1/2})O_3$—$PbTiO_3$—$PbMO_3$ wherein M represents Zr and/or Sn, and wherein a part of Pb is replaceable by at least one alkaline earth element selected from the group consisting of Ba, Ca and Sr, and containing at least one element selected from the group consisting of Bi, Sb, Ta, Nb, Th, La, Ce in an amount corresponding to 0.1 to 6.0 weight percent of respective oxide in the aggregate.

3,630,910

MAGNETIC RECORDING MEDIUM

Goro Akashi and Masaaki Fujiyama, Kanagawa, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan

No Drawing. Filed Jan. 12, 1968, Ser. No. 697,329
Claims priority, application Japan, Jan. 12, 1967, 42/2,355
Int. Cl. H01f *1/26*
U.S. Cl. 252—62.54 **8 Claims**

By incorporating fine abrasive particles in a magnetic layer containing ferromagnetic powder in a binder on a magnetic recording medium, the surface of a recording and reproducing head can be maintained in a smooth condition. The abrasive particles may also form the outer surface of the magnetic layer.

3,630,911

LEAD FERRITE GLASS-CERAMIC ARTICLES AND METHOD OF MAKING THE ARTICLES

Peter Charles Schultz, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 20, 1969, Ser. No. 835,206
Int. Cl. C03c *3/10, 3/22*
U.S. Cl. 252—62.59 **9 Claims**

This invention relates to the manufacture of glass-ceramic articles containing lead ferrites as the principal crystal phase. More particularly, this invention relates to glass-ceramic articles with compositions in the

$$PbO—Fe_2O_3—SiO_2$$

field which exhibit high magnetic susceptibility, such as to recommend their use as permanent magnets, and low electrical resistivity such as to suggest their utility as semiconductor materials.

3,630,912

LITHIUM TITANIUM BISMUTH FERRITES

Giltan Michael Argentina, Belmont, and Paul D. Baba, San Carlos, Calif., assignors to Ampex Corporation, Redwood City, Calif.

No Drawing. Filed Oct. 3, 1969, Ser. No. 863,683
Int. Cl. C04b *35/26*
U.S. Cl. 252—62.59 **3 Claims**

Microwave ferrites with narrow resonance linewidths, good temperature performance, low losses, low costs, and rectangular hysteresis loops are made from a lithium-titanium ferrite containing a small amount of bismuth. In addition, small amounts of zinc, copper or manganese can be present in the ferrites.

3,630,913

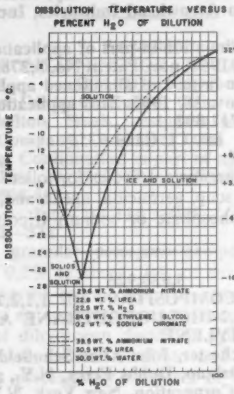
DEICER COMPOSITION

Herbert F. Scott, Jr., Prince George, and Joseph Novotny and Harry E. Ulmer, Hopewell, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 15, 1969, Ser. No. 824,808
Int. Cl. C09k *3/18;* **C23f** *11/18*
U.S. Cl. 252—70 **6 Claims**

A fluid deicer composition preferably for use to deice aircraft runways, consisting of from 22 to 26 weight percent of urea, 28 to 34 weight percent ammonium nitrate,

and 25 to 30 weight percent ethylene glycol in water, together with a sufficient amount of a water soluble chromate salt to provide from 0.05 to 0.15 percent $CrO_4^=$ ion to inhibit corrosion of aluminum and magnesium metals.


DISSOLUTION TEMPERATURE VERSUS PERCENT H_2O OF DILUTION
DISSOLUTION TEMPERATURE - °C.
SOLUTION
ICE AND SOLUTION
SOLIDS AND SOLUTION
25.0 WT. % AMMONIUM NITRATE
22.0 WT. % UREA
23.0 WT. % H_2O
24.9 WT. % ETHYLENE GLYCOL
0.1 WT. % SODIUM CHROMATE
25.0 WT. % AMMONIUM NITRATE
30.0 WT. % UREA
30.0 WT. % WATER
% H_2O OF DILUTION

3,630,914

AQUEOUS GLYCOL-BASED AUTOMOTIVE ANTIFREEZE COOLANT AND CONCENTRATE CONTAINING ANTILEAK ADDITIVE

Robert J. Nankee and Conrad D. Woods, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed July 3, 1969, Ser. No. 839,071
Int. Cl. C09k *3/02, 3/12*
U.S. Cl. 252—72 4 Claims

Small leaks in aqueous systems, e.g., automobile radiators, are stopped by the addition to the aqueous fluid of about 10 to 1000 p.p.m. of particulate cross-linked polyacrylamide, wherein the polyacrylamide particles, in dry form, are predominantly of a size that passes a 50 mesh screen but not a 200 mesh screen.

3,630,915

THERMALLY STABLE HEAT TRANSFER FLUIDS AND FLUID SYSTEMS

James D. Sullivan, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Oct. 27, 1969, Ser. No. 869,918
Int. Cl. C09k *3/02*
U.S. Cl. 252—78 9 Claims

The long term thermal stability of halogenated polyphenyl heat transfer fluids is improved by adding a phosphorus compound to the fluid and providing an inert gas purge to sweep gaseous decomposition products from the heat transfer system. Fluids maintained in this manner are less corrosive, form less solid decomposition products, and undergo a smaller viscosity increase than untreated fluids when exposed to high temperature applications for extended periods.

3,630,916

FUNCTIONAL FLUID COMPOSITIONS

Quentin Elwyn Thompson, Belleville, Ill., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed July 21, 1966, Ser. No. 566,735
Int. Cl. C09k *3/00;* C10m *3/40*
U.S. Cl. 252—78 19 Claims

Functional fluid compositions of the class which exhibit the ability to inhibit and control damage to mechanical members in contact with said compositions by the incorporation of heavy water into a class of base stocks representatives of which are the esters and amides of phosphorus, the ortho-silicates, the poly-silicones, the aryl ethers and esters. These compositions have many uses, among which are their use as hydraulic fluids.

3,630,917

HEAT TRANSFER COMPOSITION

Robert S. McCord, Pacific Palisades, Calif., assignor to Douglas McDonnell Corporation, Santa Monica, Calif.

No Drawing. Continuation of application Ser. No. 649,819, June 29, 1967, which is a continuation-in-part of application Ser. No. 344,092, Jan. 29, 1964. This application Apr. 7, 1969, Ser. No. 816,157
The portion of the term of the patent subsequent to Oct. 22, 1985, has been disclaimed
Int. Cl. C09k *3/02*
U.S. Cl. 252—78 8 Claims

Heat transfer composition consisting essentially of a tetraalkyl orthosilicate having alkyl groups each containing not in excess of 4 carbon atoms and a minor proportion not more than about 15% by weight of said composition, of a polyalkylene glycol material, preferably a polyalkylene glycol diether, such composition having low viscosity at low temperatures, i.e., less than about 250 centistokes at —65° F., good hydrolytic stability and fire resistance, and a reduced shrinkage effect on rubber O-ring seals.

3,630,918

PHOSPHORODITHIOATE SALTS FOR ATF FLUIDS

Bruce W. Hotten, Orinda, and Thomas V. Liston, Kentfield, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Mar. 29, 1968, Ser. No. 717,381
Int. Cl. C09k *3/00;* C10m *1/48*
U.S. Cl. 252—75 9 Claims

Alkali and alkaline earth metal salts (atomic Nos. 3 to 20) of O,O-di(straight chain alkylphenyl) phosphorodithioates, wherein the alkyl groups are of from 8 to 30 carbon atoms, are used in automatic transmission fluids as friction agents.

3,630,919

COLLOIDAL SILICA CLEANSING COMPOSITIONS AND METHOD

Victor E. Sheaffer, Glen Gardner, Pasquale J. Falivene, Union City, and Alan Dillarstone, Highland Park, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed June 2, 1969, Ser. No. 829,704
Int. Cl. C01b *33/14;* C09k *3/22*
U.S. Cl. 252—88 15 Claims

A mixture of colloidal silica of less than about 20 microns, inert filler and water provides an outstanding cleaner particularly for carpets and the like, especially when vigorously applied, and after a short drying period is readily removable.

3,630,920

WATER-SOLUBLE COATINGS, PACKAGES AND METHODS FOR MAKING AND USING SAME

Milton Freifeld, Boonton, N.J., and George G. Tauth, Palmerton, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 608,485, Jan. 11, 1967. This application Apr. 13, 1970, Ser. No. 28,132
Int. Cl. C21d *17/00*
U.S. Cl. 252—90 10 Claims

This invention is directed to coated compositions comprising granular detergent solids or detergent tablets coated with a water-soluble partial ester of (a) a nonionic hydroxyl-containing micelle-forming surface active agent and (b) a vinyl-maleic anhydride interpolymer, and the process for producing said coated compositions.

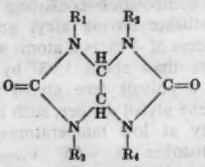
3,630,921

SCOURING AGENTS WITH A BLEACHING AND DISINFECTING ACTION

Karlheinz Disch, Hilden, Rhineland, Dieter Kuhling, Monheim, Rhineland, Peter Krings, Krefeld, and Horst Bellinger, Dusseldorf, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed Dec. 27, 1968, Ser. No. 787,623
Claims priority, application Germany, Dec. 3, 1968, P 18 12 382.5
Int. Cl. C11d 7/54
U.S. Cl. 252—95 4 Claims

Scouring agents having a bleaching and disinfecting action comprising a major amount of water-insoluble scouring components and a minor amount of essentially water-soluble components including a solid water-soluble per-compound and an effective amount of acylated glycoluril activators having the formula



wherein at least two of R_1, R_2, R_3 and R_4 are acyls of organic carboxylic acids having from 2 to 8 carbon atoms and the remainder of R_1, R_2, R_3 and R_4 are members selected from the group consisting of hydrogen, alkyl having from 1 to 8 carbon atoms, phenyl, phenylalkyl having from 7 to 8 carbon atoms, and acyls of organic carboxylic acids having from 2 to 8 carbon atoms.

3,630,922

LIQUID DETERGENT COMPOSITION

Herbert Kenneth McClain, Wyoming, and Richard Fiske Stradling, Jr., Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of application Ser. No. 649,018, June 26, 1967. This application June 3, 1968, Ser. No. 733,780
Int. Cl. C11d 7/56
U.S. Cl. 252—99 4 Claims

Stable, liquid detergent compositions for cleaning surfaces, said compositions containing particulate materials (e.g., abrasives), water, arylsulfonchloramide bleaching agents, potassium iodide, alkylbenzenesulfonate detergent, zwitterionic synthetic detergent and electrolyte, which preferably comprises a detergency builder.

3,630,923

LOW SUDSING ALKALINE DISHWASHER DETERGENT

Judith K. Simmons and Everitt A. Kitchen, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 8, 1969, Ser. No. 823,142
Int. Cl. C11d 7/56
U.S. Cl. 252—99 3 Claims

Alkaline dishwasher detergent based on an alkaline sequestrant builder, sodium silicate, a chlorine bleach, an alcohol ethoxylate nonionic surfactant and a mono- or dialkyl acid phosphate suds suppressant.

3,630,924

PREPARATION CONTAINING DEXTRANASE

Glendon Richard Miller, Basking Ridge, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,577
Int. Cl. C11d 7/54
U.S. Cl. 252—100 5 Claims

This disclosure relates to stable effervescent denture soak compositions containing dextranase particularly useful in reducing dental plaque.

3,630,925

DEODORANT AND GERMICIDAL BODIES FOR TOILETS AND URINALS

Fred H. Buck, Jr., Boonton Township, Morris County, N.J., assignor to Arrowhead Industries, Inc., Denville, N.J.

No Drawing. Continuation-in-part of application Ser. No. 563,689, July 8, 1966, now Patent No. 3,378,495, which is a continuation-in-part of abandoned application Ser. No. 508,585, Nov. 18, 1965. This application Mar. 11, 1968, Ser. No. 711,892
Int. Cl. C11d 9/50
U.S. Cl. 252—107 4 Claims

Deodorant and germicidal bodies for toilets and urinals comprising sugar, soap, germicidal agent, and, optionally, tetrasodium pyrophosphate or sodium tripolyphosphate.

3,630,926

AZEOTROPIC COMPOSITION OF 1,1,2,2-TETRACHLORO - 1,2-DIFLUOROETHANE AND TRICHLOROETHYLENE

Jan R. Haase, Rochester, John Allan Schofield, Irvington, and Roger A. Delano, Dobbs Ferry, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,419
Int. Cl. C09d 9/00; C11d 7/50; C23g 5/02
U.S. Cl. 252—171 2 Claims

The disclosure relates to azeotropic mixtures of tetrachlorodifluoroethane and trichloroethylene. It has been discovered that this azeotrope may be used in solvent vapor cleaning and degreasing applications.

3,630,927

SOAP COMPOSITIONS CONTAINING ALKYL AMINO DIACETATES AS LIME SOAP DISPERSANTS

Chung Yu Shen, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Mar. 10, 1970, Ser. No. 18,289
Int. Cl. C11d 1/10, 9/46; B01f 17/28
U.S. Cl. 252—117 5 Claims

The tendency of natural soap compositions to deposit precipitates in hard water is inhibited by addition of 5 to 70% by weight alkali metal alkyl amino diacetates wherein the alkyl group contains from 10 to 24 carbon atoms.

3,630,928

PARTICLES CONTAINING MIXTURES OF POLYPHOSPHATES AND SILICATES

Robert J. Fuchs, Clark, N.J., assignor to FMC Corporation, New York, N.Y.

No Drawing. Filed Jan. 8, 1968, Ser. No. 696,114
Int. Cl. C11d 7/14, 7/16, 11/00
U.S. Cl. 252—135 3 Claims

Strong, stable particles containing a mixture of a sodium tripolyphosphate and a silicate, wherein the SiO_2 to tripolyphosphate mole ratio is at least 1:1, were produced by admixing sodium tripolyphosphate and an aqueous solution of an alkali metal silicate to obtain a sticky mixture which agglomerates into soft, deformable granules, drying the granules at from 60 to 80° C. and recovering the resulting, dried, granular particles.

3,630,929

FAST DISSOLVING NONAQUEOUS BUILT LIQUID DETERGENT COMPOSITIONS

Antonie Brand van Dijk, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,124
Claims priority, application Luxembourg, Jan. 17, 1969, 57,796
Int. Cl. C11d 3/075, 7/42
U.S. Cl. 252—136 7 Claims

The rate of solution of a substantially non-aqueous, built liquid detergent composition comprising a water-free

liquid detergent surfactant, an inorganic carrier material and a builder is improved by the incorporation therein of a small amount of an acid substance.

3,630,930

ENZYME-CONTAINING, GRANULAR DETERGENT COMPOSITION

Jerry Edison Davis, Cincinnati, Ohio, and Howard John Wick, Shelton, Wash., assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of application Ser. No. 691,205, Dec. 18, 1967. This application Mar. 19, 1969, Ser. No. 808,663

Int. Cl. C11d *3/065, 1/12*

U.S. Cl. 252—531 13 Claims

Alkaline, granular detergent composition containing from about 0.5% to about 20% of enzyme carrier granules, said enzyme carrier granules comprising phosphate builder salts, an acid component selected from the group consisting of dihydrogen disodium pyrophosphate, sodium bicarbonate, sodium bisulfate and mixtures thereof, and alkaline proteases or mixtures of alkaline proteases α-amylases.

3,630,931

COMPOSITIONS FOR CLEANING STONE, BRICKS AND CONCRETE

Georges Salomone, Paris, France, assignor to Societe Anonyme SEFA, Paris, France

No Drawing. Continuation-in-part of application Ser. No. 543,024, Apr. 18, 1966, now Patent No. 3,481,879, dated Dec. 2, 1969. This application Sept. 15, 1969, Ser. No. 869,990

The portion of the term of the patent subsequent to Dec. 2, 1986, has been disclaimed

Int. Cl. C11d *7/08, 7/10, 7/26*

U.S. Cl. 252—142 2 Claims

A product for cleaning stone, bricks, concrete and other constructional material consists essentially of an aqueous paste having as a base ammonium bifluoride, barium chloride, hydrofluoric acid and ammonium sulfate with a stabilizing sugar.

3,630,932

CORROSION-INHIBITED MINERAL ACIDS

Robert J. Tedeschi, Whitehouse Station, and Paul W. Natali, Middletown, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Filed Dec. 31, 1968, Ser. No. 789,019

Int. Cl. C11d *7/26;* C23g *1/06*

U.S. Cl. 252—146 9 Claims

Aqueous acid solutions are inhibited against corrosion of metals, especially ferrous metals, by incorporation of a corrosion-inhibiting system composed of a combination of 4-ethyl-1-octyn-3-ol and 1,10-diethyl-7-tetradecyn-6,9-diol.

3,630,933

AMINE INHIBITORS FOR ACIDIC CLEANING SOLUTIONS

Walter R. Dudlik, Ambler, and George S. Gardner, Elkins Park, Pa., assignors to Amchem Products, Inc., Ambler, Pa.

No Drawing. Filed Jan. 19, 1968, Ser. No. 699,051

Int. Cl. C11d *7/32;* C23g *1/06*

U.S. Cl. 252—148 23 Claims

Acidic cleaning solutions, which have little or no tendency to corrode metal surfaces, containing amine compounds prepared by reacting a specific amine starting material, formaldehyde and a ketone in the presence of acid, are described. The amine starting material is of the formula

$$CH_3(CH_2)_n-\underset{\displaystyle HN-Z}{\overset{\displaystyle |}{CH}}-R$$

wherein n is an integer ranging from about 2 to about 20, R is selected from the group consisting of hydrogen and $CH_3(CH_2)_{m-1}$, wherein m is an integer ranging from 1 to about 21, and Z is selected from the group consisting of hydrogen and the propylamine radical.

3,630,934

MILDNESS ADDITIVE

Ralph Kelly, Cincinnati, and Edmond Jean Ritter, Loveland, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

No Drawing. Continuation-in-part of application Ser. No. 613,095, Feb. 1, 1967. This application Jan. 9, 1968, Ser. No. 696,509

Int. Cl. C11d *3/20*

U.S. Cl. 252—547 14 Claims

The degree of skin irritation of detergent compositions is reduced by adding to the detergent compositions small amounts of a hydroxyl derivative of a polymerized fatty acid or a hydroxyl derivative of a hydrogenated (saturated) polymerized fatty acid, e.g. the hydroxy derivative of dimer acid.

3,630,935

DRY CLEANING COMPOSITION

Gordon W. Potter, Jr., Greenhills, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Dec. 16, 1969, Ser. No. 885,652

Int. Cl. C11d *11/18, 3/24;* D06l *1/04*

U.S. Cl. 252—153 9 Claims

A dry cleaning composition, having a pH in the range of from about 6.5 to about 9, consisting essentially of from about 20% to about 99.94% by weight of a dry cleaning solvent and from about 0.06% to about 80% of an anionic detergent comprising the monoethanolamine salt of an essentially pure, broad cut, linear C_8 to C_{18} benzene sulfonic acid; the composition, when employed in conventional dry cleaning operations, improves fabric cleaning and reduces fabric graying.

3,630,936

DRAIN CLEANER

Robert E. Hill, Memphis, Tenn., assignor to Armour and Company, Chicago, Ill.

No Drawing. Filed Feb. 4, 1966, Ser. No. 525,105

Int. Cl. C11d *7/06, 7/12*

U.S. Cl. 252—157 5 Claims

A composition providing heat when mixed with water, and a method for making the same. In this composition, aluminum particles and water soluble inorganic nitrate particles are bonded to the surface of alkali metal hydroxide particles.

3,630,937

SULFONATED POLYSTYRENE COMPOSITIONS AND METHODS OF TREATING BOILER WATER

Raymond N. Baum, Pittsburgh, Edward N. Rebis, Coraopolis, and Phillip B. Reilly, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Filed May 6, 1968, Ser. No. 727,005

Int. Cl. C02b *1/18, 5/06*

U.S. Cl. 252—181 14 Claims

Compositions and methods for boiler water treatment are disclosed. The compositions contain a sulfonated polystyrene to act as a dispersive; in addition, they may contain a chelating agent such as Na_3NTA. A useful composition combines the polymer with a silicate and/or a phosphate.

3,630,938

CHROMATE AND ORGANOPHOSPHATE COMPOSITIONS AND METHODS FOR CONTROLLING SCALE AND INHIBITING CORROSION

Edwin S. Troscinski, Oak Lawn, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed Sept. 29, 1969, Ser. No. 862,050
Int. Cl. C02b *1/18, 5/02*
U.S. Cl. 252—181 10 Claims

This invention relates to methods and compositions used to inhibit scale formation and/or the formation of solid scale forming salts and to prevent corrosion in water or brine comprising adding to said water or brine small amounts of certain compounds containing chromates and organophosphates.

3,630,939

COMPOSITIONS AND METHODS FOR THE PRODUCTION OF CHEMILUMINESCENT COLD LIGHT

Harold W. Schneider, % The Varniton Co., Box 433, North Palm Springs, Calif. 92258

No Drawing. Filed Jan. 14, 1969, Ser. No. 791,155
Int. Cl. C09k *3/00*
U.S. Cl. 252—186 7 Claims

Chemiluminescent cold light of selected color to continue for up to six days duration is produced by the intimate mixture of a luminol-dimethylsulfoxide mixture, with a less than 20% by volume water solution of dimethylsulfoxide saturated with a hydroxide, with the mixture and solution initially maintained in the presence of air. The addition of fluorescein may be made to change the color of the light. Methods of producing the chemiluminescent cold light are also described.

3,630,940

2-MERCAPTOBENZOTHIAZOLE/TETRAALKYLTHIURAM DISULFIDE MIXTURE

Richard Leshin, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Apr. 28, 1969, Ser. No. 819,970
Int. Cl. C08c *11/56, 11/62*
U.S. Cl. 252—182 15 Claims

Process of preparing a mixture of 2-mercaptobenzothiazole and tetraalkylthiuram disulfide in an aqueous medium involving the forming of a tetraalkylthiuram disulfide slurry containing a reducing agent prior to incorporating the 2-mercaptobenzothiazole with the tetraalkylthiuram disulfide slurry.

3,630,941

INFRARED FLUORESCING SYSTEMS

William Russell Bergmark, Buffalo, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Sept. 3, 1968, Ser. No. 807,468
Int. Cl. C09k *3/00*
U.S. Cl. 252—186 7 Claims

An infrared fluorescent solution comprising 16,17-dialkoxyviolanthrones in a solvent, and a method for obtaining infrared emission by radiant or chemical excitation of the fluorescent solution.

3,630,942

REMOVAL OF ORGANIC IODINE FROM RADIOIODINE-CONTAINING ATMOSPHERES

Benadetto A. Soldano and Wilfred T. Ward, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Feb. 17, 1969, Ser. No. 799,905
Int. Cl. B01d *47/06*
U.S. Cl. 252—188 2 Claims

A spray or scrub solution for removing iodine from gases in contact therewith comprises:

(a) An aqueous solution adjusted to a pH in the range 9 to 10 with an alkali metal hydroxide such as potassium hydroxide or sodium hydroxide, said solution containing

(b) Up to .3 weight percent boron as borate,

(c) A reducing agent for molecular or atomic iodine selected from the group consisting of sodium thiosulfate and formaldehyde, and

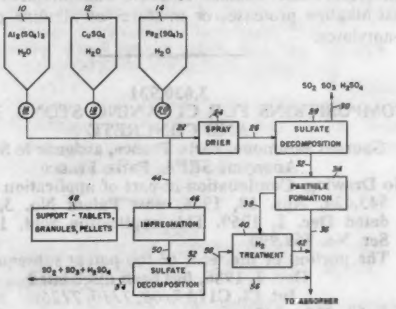
(d) From 0 to an effective amount of a free radical getter, or a material which reacts with hydrated electrons.

3,630,943

PREPARATION OF ABSORBENTS FOR SULFUR OXIDE REMOVAL

John G. Myers and Joseph H. Field, Pittsburgh, Pa., assignors to the United States of America as represented by the Secretary of the Interior

Filed Aug. 14, 1969, Ser. No. 850,098
Int. Cl. C09k *3/00*
U.S. Cl. 252—190 6 Claims



Mixtures of sulfate salts selected from the group consisting of $Al_2(SO_4)_3$-$CuSO_4$; $CuSO_4$-$Fe_2(SO_4)_3$; and $Fe_2(SO_4)_3$-$Al_2(SO_4)_3$ are decomposed to the corresponding oxides and made into particulate form for use as an absorbent in sulfur oxide absorption from gases. The absorbents can be used unsupported or on a suitable support material. In either case, the absorbents are capable of regeneration.

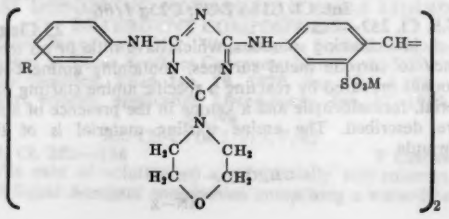
3,630,944

OPTICAL BRIGHTENING AGENTS WITH HIGH WHITENING POWER, THEIR MANUFACTURE AND USE

Masaaki Ohkawa, Takatsuki-shi, Masatoshi Matsuo, Ibaragi-shi, Tadao Sakaguchi, Osaka, Syozi Sato, Hirakata-shi, and Yoshikazu Momoi, Osaka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Jan. 27, 1969, Ser. No. 794,388
Claims priority, application Japan, Mar. 14, 1968, 43/16,916; Apr. 9, 1968, 43/23,619
Int. Cl. C09k *1/0;* F21k *2/00*
U.S. Cl. 252—301.3 W 14 Claims

β-Form crystals of a compound represented by the formula



wherein R is hydrogen atom or methyl group; and M is sodium or potassium having a particle size of about $1 \times 2\mu$ which is prepared by pulverizing said crystals in the presence of alkaline phosphates and/or alkaline silicates or in the presence of alcohol, ester, ketone, hydrocarbon or a mixture thereof.

3,630,945

DIVALENT EUROPIUM ACTIVATED ALKALINE EARTH ALUMINUM FLUORIDE LUMINESCENT MATERIALS AND PROCESS

Mary V. Hoffman, South Euclid, Ohio, assignor to General Electric Company

Filed Apr. 6, 1970, Ser. No. 25,760

Int. Cl. C09k *1/04*

U.S. Cl. 252—301.4 R 10 Claims

$SrAlF_5$, $BaAlF_5$, and $Ba_3Al_2F_{12}$, all activated with divalent europium substituting for the alkaline earth metal, are shown to be efficient producers of sharp line ultraviolet emission resulting from $4f$ to $4f$ energy level transitions in the divalent europium, as contrasted to previous luminescent materials utilizing divalent europium as an activator in which the emission is a band due to $5d$ to $4f$ transitions. Solid state and precipitation methods for producing these phosphors are disclosed. These materials are useful as phosphors in cathode ray tubes, lamps, and other applications.

3,630,946

METHOD OF PREPARING RARE EARTH METAL ORTHOVANADATE PHOSPHOR

Richard C. Ropp, Warren, and Raymond Oakley, Newark, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Filed Nov. 18, 1969, Ser. No. 877,858

Int. Cl. C09k *1/44*

U.S. Cl. 252—301.4 R 8 Claims

An improved method of precipitating the raw-mix constituents of rare earth metal orthovanadate phosphor from aqueous solution, and preparing a superior rare earth metal activated rare earth metal orthovanadate composition. The constituents are dissolved in acid solution, with vanadium pentoxide being dissolved in concentrated hydrochloric acid to provide a high concentration of vanadyl radical in solution. Predetermined amounts of hydroxyl radical containing compound and sodium perborate are admixed with the rare earth metal and vanadium containing acid solutions so that the pH of the resulting mixture is at least 7.5 to provide a condition under which rare earth metal orthovanadate is very efficiently precipitated. The precipitant is calcined to provide an activated, efficient rare earth metal orthovanadate phosphor.

3,630,947

EUROPIUM STRONTIUM CHLORIDE PHOSPHATE FLUORESCENT COMPOSITION

Lothar H. Brixner, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 17, 1969, Ser. No. 867,990

Int. Cl. C09k *1/06, 1/36*

U.S. Cl. 252—301.4 P 1 Claim

Luminescent compositions of the formula

$$Sr_{5-x}Eu_x(PO_4)_3Cl$$

where x has a value from 0.04 to 0.5; the compositions are prepared by a flux-reaction technique using sources of strontium chloride, P_2O_5, and europium oxide in the presence of water vapor. The product crystallizes as colorless needles having the $P6_3/m$ space group of apatite. Under ultraviolet, X-ray or electron excitation, the compositions fluoresce strongly emitting blue light.

3,630,948

BISMUTH ACTIVATED YTTRIUM OXYSULPHATE

George Blasse and Jaap de Vries, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1970, Ser. No. 14,397

Claims priority, application Netherlands, Feb. 28, 1969, 6903112

Int. Cl. C09k *1/22*

U.S. Cl. 252—301.4 S 2 Claims

A luminescent material which exhibits radiation in the ultraviolet region and which is a bismuth activated yttrium oxysulfate.

3,630,949

AEROSOL STATIC-DISSIPATING MATERIAL

Adolph F. Brux, Los Angeles, Calif. (11 S. Termino Ave. 313, Long Beach, Calif. 90803), and Gary V. Dubin, 3100 Cherry Creek S. Drive, Denver, Colo. 80209

No Drawing. Filed Jan. 5, 1968, Ser. No. 695,881

Int. Cl. C09k *3/30*

U.S. Cl. 252—305 7 Claims

A chemical composition consisting of a high-melting-point fatty ammonium chloride compound of a waxy consistency and a low order of toxicity and which is film-forming, a straight-chain fatty acid to prevent opacity of such a film, a compatible solvent system for said film-forming and opacity-preventing ingredients, and propellants forming a system for pressurizing the foregoing ingredients and solvents to produce an aerosol for storage in a dispensing container and dispensing therefrom under pressure of the propellants.

3,630,950

COMBUSTIBLE COMPOSITIONS FOR GENERATING AEROSOLS, PARTICULARLY SUITABLE FOR CLOUD MODIFICATION AND WEATHER CONTROL AND AEROSOLIZATION PROCESS

Henry M. Papee, Alberto C. Montefinale, and Gianna L. Petriconi, all of Via Vettore 4 (Monte Sacro), 00141, Rome, Italy, and Tadeusz W. Zawidzki, 497 Brittany Drive, Ottawa 7, Ontario, Canada

Continuation-in-part of application Ser. No. 742,956, June 19, 1968. This application Nov. 21, 1968, Ser. No. 777,581

Int. Cl. A01g *15/00;* C09k *3/30;* E01h *13/00*

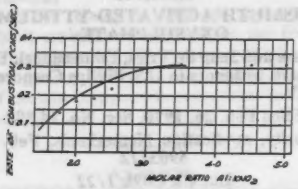
U.S. Cl. 252—305 11 Claims

A combustible composition for generating aerosols for the control and modification of weather conditions consisting of a readily oxidizable substance selected from the group consisting of aluminum, magnesium, alkali-metals and alkaline earth metals; an oxidizing agent selected from the groups consisting of:

(a) sulphur and suphur yielding compounds; and
(b) organic and inorganic nitrates, alkali-metal and ammonium chlorates and perchlorates;

the molar ratio of the oxidizable substance to the oxidizing agent being between 1.5:1 and 3.5:1 and a stable hygroscopic solid which does not directly participate in the combustion process of the combustible composition,

said hygroscopic solid being present in an amount up to 40% of the total weight of the combustible composition, the oxidizable substance, the oxidizing agent and the hygroscopic substance having a particle size in the range of from −140 to +270 mesh, and a primer initiating



the combustion of said composition whereby during combustion, a finely dispersed aerosol smoke consisting of moderately hygroscopic condensation nuclei, and a non-hygroscopic gas are simultaneously evolved, said gas acting to disperse said nuclei.

3,630,951

BUBBLE COMPOSITIONS

George P. Netherly, Afton Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,747

Int. Cl. B01j *13/00*

U.S. Cl. 252—307 **4 Claims**

Bubble compositions comprising water, a humectant and a water soluble bubble forming compound containing a fluoroaliphatic radical and a water solubilizing group which can be used to form long lasting large pendulous bubbles.

3,630,952

METAL-PHOSPHO-SILICA COMPOSITION AND METHOD OF MANUFACTURE

Claudius Nielsen, 18464 Harlow Ave., Detroit, Mich. 48235

No Drawing. Continuation-in-part of applications Ser. No. 355,936, Mar. 30, 1964, Ser. No. 372,385, June 3, 1964, and Ser. No. 404,901, Oct. 19, 1964. This application July 14, 1969, Ser. No. 841,564

Int. Cl. B01j *13/00;* **C09d** *5/08;* **C23f** *11/18*

U.S. Cl. 252—309 **38 Claims**

A metal-phospho-silica composition useful as a component of paints, lacquers, adhesives, sealing agents, caulking agents and the like, to impart anti-corrosion, impermeability and intumescence to such compositions, in which a divalent or trivalent metal, metal oxide or metal salt is reacted with orthophosphoric acid in a ratio sufficient to form a metal hydrogen phosphate solution containing metal dihydrogen phosphate in a major proportion and free orthophosphoric acid in a minor proportion; and thereafter, reacting a major proportion of the metal hydrogen phosphate solution with a minor proportion of an alkali metal silicate in a ratio sufficient to form a soft, non-crystalline metal-phospho-silica composition. The metal-phospho-silica composition is substantially insoluble in water and in most organic solvents, but it is readily dispersed therein; and may be dispersed in such materials by the addition of a suitable surface active agent. The metal-phospho-silica composition may also be produced in powdered form by utilizing any one of several techniques for removing water from the reaction product.

3,630,953

TAILORED SURFACTANTS FOR USE IN FORMING OIL-IN-WATER EMULSIONS OF WAXY CRUDE OIL

Ralph Simon, Whittier, and Alan H. Beyer, Fullerton, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Jan. 2, 1968, Ser. No. 694,876

Int. Cl. B01j *13/00*

U.S. Cl. 252—312 **3 Claims**

Disclosed is a method of making oil-in-water emulsions of waxy crude oils for transporting same by use of a surfactant mixture of nonionic surfactants each composed of differing amounts of ethylene oxide in the hydrophilic portions.

3,630,954

ORGANIC AMINE-STRONG BASE STABILIZED HIGH SURFACE AREA SILICA SOLS AND METHOD FOR PREPARING SAME

Paul C. Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 8, 1969, Ser. No. 823,185

Int. Cl. B01j *13/00;* **B28b** *7/34;* **C01b** *33/14*

U.S. Cl. 252—313 S **5 Claims**

Compositions consisting essentially of colloidal silica sols having a surface area of from 950 to 1800 $m.^2$/gram stabilized with a co-stabilizer system consisting of (1) an organic or inorganic base having a basic dissociation constant greater than 10^{-2} and (2) an organic monoamine are useful as refractory binders.

3,630,955

GRAFT POLYMERIZATION AS A CAPSULE WALL TREATING PROCESS

Donald Day Emrick, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Jan. 29, 1968, Ser. No. 701,126

Int. Cl. B01j *13/02;* **B44d** *1/02, 1/44*

U.S. Cl. 252—316 **9 Claims**

A process is provided for treating, en masse, existing capsule walls of hydrophilic polymeric material, in a liquid manufacturing vehicle, to seal the capsule walls against loss of fluid materials through permeation pathways. The process includes reacting material of the capsule walls with certain transition metals to provide nucleation sites unless such sites are already present and then initiating a free-radical-generated polymerization reaction wherein polymeric material is created interstitially or internally within the wall material during which it becomes grafted onto molecular units of the capsule wall material. Capsules resulting from practice of this invention have walls which exhibit greatly decreased permeation of fluids when compared with untreated capsule walls of like material. Examples of materials to be used for the graft-polymerization of free-radical-generated polymeric material include acrylonitrile, methacrylonitrile, fumaronitrile, and itacononitrile.

ERRATUM

For Class 252—373 see:
Patent No. 3,631,073

3,630,956

METHOD OF PRODUCING GASES WITH CONTROLLED CONCENTRATIONS OF WATER VAPOR

Michael A. Benning, Allentown, and Alan H. Singleton, Emmaus, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

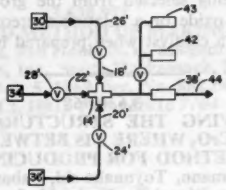
Filed Apr. 1, 1969, Ser. No. 812,246

Int. Cl. C09k *3/00;* **C01b** *5/00;* **B01j** *11/08*

U.S. Cl. 252—372 **12 Claims**

Processes are disclosed for the preparation of gas mixtures having a stable, controlled content of water vapor.

The invention is characterized by the catalytic conversion to water of accurately determined quantities of hydrogen and oxygen contained in the gas to be humidified. The processes are suitable for use in both cylinder and pipeline transportation of gases.



3,630,957

DIAGNOSTIC AGENT

Hans-Georg Rey, Pieter Rieckmann, Hans Wielinger, and Walter Rittersdorf, Mannheim-Waldhof, Germany, assignors to Boehringer Mannheim Gesellschaft mit beschrankter Haftung, Mannheim-Waldhof, Germany

No Drawing. Filed Nov. 15, 1967, Ser. No. 683,129
Claims priority, application Germany, Nov. 22, 1966, B 89,944
Int. Cl. G01n *31/22, 33/16*
U.S. Cl. 252—408 24 Claims

Diagnostic agents for use in the detection of biochemical and chemical components in blood, urine and other biological fluids are disclosed comprising water-resistant films in which a composition forming color in response to said chemical or biological component is uniformly distributed.

3,630,958

TEST COMPOSITION AND METHOD FOR DETECTING REDUCING SUGARS IN AQUEOUS FLUIDS

Helen Mae Free and John Robert Wisler, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,380
Int. Cl. C09k *3/00*; G01n *33/16*
U.S. Cl. 252—408 8 Claims

Test composition and method for detecting reducing sugars in aqueous biochemical and industrial fluids comprising a dry solid mixture of an acid material, an alkaline material, a cupric salt and a surface active agent capable of forming a substantially monomolecular film at the liquid-vapor interphase of the fluid being tested.

3,630,959

CARBONIZATION OF BITUMINOUS COALS

Oliver A. Kiikka, Willoughby, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

No Drawing. Filed June 4, 1969, Ser. No. 830,509
Int. Cl. C01b *31/08*
U.S. Cl. 252—422 4 Claims

Carbonization of bituminous coal wherein the coal is acidified with a liquid sulfonating agent such as sulfuric acid or oleum and thereafter carbonized by heating to a temperature in the range of 600° C. to 900° C., the heating rate in the temperature range of 400° C. to 600° C. being in excess of 10° C. per minute. The acidified coal is preferably deacidified prior to carbonization by heating at a temperature in the range of 400° F. to 700° F. with or without a sweeping airstream. Acid treatment of the bituminous coals permits carbonization thereof at an accelerated rate without caking during heating through the temperature range of 400° C. to 600° C.

3,630,960

ORGANIC PEROXIDE ENOLIZABLE KETONE COMPOSITIONS

Edward Chetakian, Anaheim, Calif., assignor to The Norac Company, Inc., Azusa, Calif.

No Drawing. Continuation-in-part of applications Ser. No. 732,077, May 27, 1968, and Ser. No. 831,720, June 9, 1969, the latter being a continuation-in-part of application Ser. No. 732,078, May 27, 1968, and with said Ser. No. 732,077 is a continuation-in-part of application Ser. No. 447,547, Apr. 12, 1965, now Patent No. 3,398,213, application Ser. No. 447,547 being in turn a continuation-in-part of application Ser. No. 50,308, Aug. 18, 1960. This application Apr. 27, 1970, Ser. No. 32,339
Int. Cl. C08f *21/00*
U.S. Cl. 252—426 24 Claims

Compositions of hydroperoxides, ketones peroxides and peresters with B-diketones and derivatives of acetoacetic acid are useful low hazard initiators for polymerization.

3,630,961

HYDROCARBON ISOMERIZATION PROCESS

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 835,218, June 20, 1969. This application Aug. 22, 1969, Ser. No. 852,463
Int. Cl. B01j *11/74, 11/78, 11/12*
U.S. Cl. 252—439 5 Claims

Isomerizable hydrocarbons are isomerized using a catalytic composite comprising a combination of a platinum group component and a lead component uniformly distributed throughout a porous carrier material wherein the catalytic composite contains, on an elemental basis, about 0.01 to about 2 wt. percent platinum group component and lead in an atomic ratio of lead to platinum group component of from about 0.05:1 to about 0.9:1. A catalytic composite comprising a refractory inorganic oxide combined with a Friedel-Crafts metal halide and having uniformly dispersed therewith a platinum group component and a lead component is also disclosed.

3,630,962

AZINES AND HYDRAZONES AS PAINT DRIER ACCELERATORS

Christian H. Stapfer, Newtown, Pa., assignor to Carlisle Chemical Works, Inc., Reading, Ohio

No Drawing. Filed Mar. 13, 1970, Ser. No. 19,512
Int. Cl. C09d *3/64*
U.S. Cl. 252—431 C 10 Claims

Organic azines or hydrazones are used as activators for cobalt, ziraconium, iron, manganese and zinc carboxylates driers for drying alkyd paints and varnishes or to promote oxidative polymerization of olefinic polymer systems, particularly unsaturated polyester resins in conjunction with organic peroxides and cobalt or other transition metal driers. The azines or hydrazones can be stabilized with phenolic antioxidants. The azines are preferred to the hydrazones, cyclohexane azine being most preferred. Particularly good results are obtained with cobalt driers and azines (or hydrazones) due to the formation of a blue complex which has a whitening effect on the composition.

3,630,963

REACTION PRODUCTS OF HALOARYLLITHIUM COMPOUNDS AND VINYLTIN COMPOUNDS AS POLYMERIZATION INITIATORS

William J. Trepka and Richard J. Sonnenfeld, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,579
Int. Cl. C08d *3/06*
U.S. Cl. 252—431 R 3 Claims

The reaction products of vinyltin compounds with 3-halophenyllithium, 1-halo-3-naphthyllithium, 3-halo-1-naphthyllithium, 4-halophenyllithium, or 4-halonaphthyl-

lithium are employed as initiators for the polymerization of conjugated dienes to polymers having a higher cis content and lower inherent viscosity than those ordinarily obtained with organolithium initiators.

3,630,964

CATALYST FOR OXIDATION OF ALIPHATIC DIENES TO FURALDEHYDES

Theodor Vrbaski, Harvey, Ill., and Thomas David Sheehan, Kalamazoo, Mich., assignors to Atlantic Richfield Company

No Drawing. Original application Mar. 25, 1968, Ser. No. 715,492, now Patent No. 3,546,257, dated Dec. 8, 1970. Divided and this application Dec. 2, 1969, Ser. No. 882,380

Int. Cl. B01j *11/74*

U.S. Cl. 252—439 4 Claims

A catalyst for the vapor phase oxidation of a 1,3-diene selected from the group consisting of 1,3-pentadiene and 2-methyl-1,3-butadiene to produce a furaldehyde. The catalyst contains oxides of copper, arsenic, tellurium, and molybdenum. The metals are present in the catalyst in the following atomic ratios:

$$Cu_aAs_bTe_cMo_d$$

wherein *a* is about 2 to 20, *b* is about 0.1 to 15, *c* is about 0.1 to 5, and *d* is about 20 to 30.

3,630,965

HYDROCARBON CONVERSION CATALYST

Alexis Voorhies, Jr., Baton Rouge, and Charles N. Kimberlin, Jr., East Baton Rouge, La., assignors to Esso Research and Engineering Company

No Drawing. Filed Mar. 11, 1969, Ser. No. 806,272

Int. Cl. B01j *11/78*

U.S. Cl. 252—442 16 Claims

Improved hydrocarbon catalysts are prepared by treating certain zeolites with hydrogen fluoride. It is preferred that the hydrogen fluoride treatment be accomplished after those preparation steps requiring contact of the zeolite with water at high temperatures. It is also preferred that the zeolite which is subjected to the HF treatment have a substantial portion of its alkali metal content replaced by the hydrogen ion.

3,630,966

PREPARATION OF SHAPED SELECTIVE TRANSITION METAL ZEOLITE CATALYST

Nai Yuen Chen, Cherry Hill, and Edward J. Rosinski, Deptford, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Feb. 25, 1969, Ser. No. 802,220

Int. Cl. B01j *11/58*

U.S. Cl. 252—455 Z 7 Claims

A method for preparing an improved shape selective catalyst composition from a crystalline aluminosilicate having a silicon to aluminum atomic ratio of at least 1.8 and a pore size of about 5 angstrom units, e.g., an erionite-type zeolite, natural or synthetic, by contacting the same with sulfur or a compound thereof, which contacting can be preceded or followed by aqueous metal exchange or impregnation with a transition metal, and reforming a hydrocarbon charge stock in the presence thereof.

3,630,967

URANIUM OXIDE CATALYST

Thomas Nicklin, Middleton, Joseph Clack, Formby, and Kenneth Harold Burgess, Handforth, England, assignors to The Gas Council, London, England

No Drawing. Filed June 19, 1967, Ser. No. 647,245

Claims priority, application England, June 21, 1966, 27,578/66

Int. Cl. B01j *11/32, 11/36*

U.S. Cl. 252—465 15 Claims

The invention provides a process for the preparation of a catalyst, which process comprises subjecting a composition comprising a first component, together with a second component, disposed on a catalyst support to at least two reduction-oxidation cycles, said first component being selected from the group consisting of uranoso-uranic oxide, uranium trioxide and a mixture thereof and said second component being selected from the group consisting of nickel, nickel oxide or a mixture thereof. The invention also provides a catalyst when prepared by the method.

3,630,968

OXIDE HAVING THE STRUCTURAL FORMULA $(La_{1-x}Ca_x)CrO_3$ WHERE *x* IS BETWEEN .01 AND .15 AND A METHOD FOR PRODUCING THE SAME

Yoshiteru Hamano, Toyonaka-shi, Saburo Kose, Kyoto, and Makoto Kinoshita, Ikeda-shi, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

No Drawing. Filed July 15, 1969, Ser. No. 842,018

Int. Cl. H01b *1/08;* C04b *35/12*

U.S. Cl. 252—521 3 Claims

A mixture of lanthanum oxide, calcium carbonate and chrome oxide is fired to produce a solid solution wherein a percentage of the lanthanum ions of the lanthanum oxide have been replaced by calcium ions. This solid solution is then pulverized and molded to produce an electrode of high electron conductivity especially appropriate for use in the magneto-hydro-dynamic generator.

3,630,969

RESISTOR COMPOSITIONS CONTAINING PYROCHLORE-RELATED OXIDES AND PLATINUM

Michael J. Popowich, Amherst, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 24, 1969, Ser. No. 869,350

Int. Cl. H01b *1/02;* B44d *1/02*

U.S. Cl. 252—514 13 Claims

Resistor compositions, which yield, upon firing, smooth resistors having a wide range of resistances, low TCR's and good stability properties, comprising (1) an oxide of the formula

$$(M_xBi_{2-x}(M'_yRu_{2-y})O_{7-z}$$

wherein

M is at least one metal selected from the group consisting of yttrium, lanthanum, thallium, indium, cadmium,

M' is at least one metal selected from the group consisting of platinum, titanium, tin, chrominum, rhodium, iridium, rhenium, zirconium, antimony and germanium, (2) an inorganic binder, and (3) a required amount of platinum. The control over properties afforded by this combination of ingredients and proportions thereof enhances the significance of this invention.

3,630,970

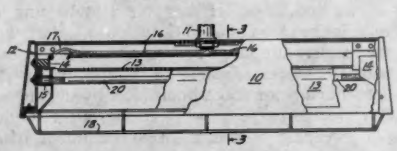
RESISTOR

Karl E. Nelson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 24, 1968, Ser. No. 739,446

Int. Cl. H01b *1/06;* C09c *1/04*

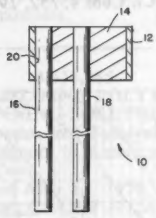
U.S. Cl. 252—518 8 Claims



Semiconductors useful as electrical resistance heating elements and composed principally of zinc oxide have a

resistivity value not higher than ten ohm-cm. at 25° C. and not higher than one ohm-cm. at 925° C., the ratio being between about one and about ten.

3,630,971
SENSOR AND METHOD OF MAKING SAME
Frederic R. Quinn, Red Hook, N.Y., assignor to Zyrotron Industries, Inc., South Hackensack, N.J.
Filed Dec. 5, 1969, Ser. No. 882,549
Int. Cl. H01b *1/06;* H01c *7/04*
U.S. Cl. 252—518 27 Claims



Metal sulfide compounds and metal phosphate compounds are combined in a selected manner to form a resistance material for a stable sensor having a variable resistance characteristic in response to changes in temperature and voltage. The resistance material exhibits a large resistance variation as temperature of a medium being sensed passes through a critical value. The critical value is selected by choosing the types of compounds in the sensor. Resistance material is prepared in a preselected manner to obtain reliable performance characteristics throughout adverse environmental conditions. An oxide of a metal also present in the electrical leads connected to the sensor is dispersed throughout the sensor to provide strong lead attachments.

3,630,972
PROCESS FOR POLYBENZIMIDAZOLES
Carl S. Marvel, Tucson, Ariz., Jerry G. Higgins, Bloomington, Ill., and Rolf Pense, Frankfurt-Hochst, Germany, assignors to Research Corporation, New York, N.Y.
No Drawing. Filed Feb. 7, 1969, Ser. No. 797,667
Int. Cl. C08g *33/02*
U.S. Cl. 260—2 R 2 Claims

2-arylbenzazoles, i.e. 2-arylbenzimidazoles, 2-arylbenzoxazoles and 2-arylbenzthiazoles, are prepared by the condensation of an aromatic aldehyde bisulfite adduct with o-phenylenediamine, o-aminophenol and o-thiophenol, respectively.

Polybenzimidazoles, known polymers particularly useful in the fabrication of articles intended for use at elevated temperatures, are prepared by the condensation of aromatic tetraamines with aromatic dialdehyde bis-bisulfite adducts.

3,630,973
LOW VISCOSITY POLYOL BLENDS AND RIGID POLYURETHANE FOAMS PREPARED THEREFROM
Alan E. Ardis, North Haven, Conn., and Milton Lapkin, Barrington, R.I., assignors to Olin Corporation, New Haven, Conn.
No Drawing. Continuation-in-part of abandoned application Ser. No. 633,726, Apr. 26, 1967. This application Mar. 24, 1970, Ser. No. 22,368
Int. Cl. C08g *22/06, 22/46, 22/48*
U.S. Cl. 260—2.5 AS 10 Claims

The addition of small amounts of low-molecular-weight glycols to highly viscous polyether polyols provides polyol blends having reduced viscosities and improved handling characteristics. Polyurethane foams having desirable physical properties can be prepared from these polyol blends. Such polyurethane foams are of utility in numerous applications including insulation, cushioning and the like.

3,630,974
TERNARY RUBBER BLEND
Lewis T. Ladocsi, South Orange, and Donald G. Young, Mountainside, N.J., assignors to Esso Research and Engineering Company
No Drawing. Continuation of application Ser. No. 657,493, Aug. 1, 1967. This application Jan. 29, 1970, Ser. No. 6,969
Int. Cl. C08c *9/04, 9/08, 9/10*
U.S. Cl. 260—5 9 Claims

A three part blend of ethylene-propylene terpolymer, halobutyl rubber, and a high unsaturation rubber, has surprisingly improved physical properties after vulcanization.

3,630,975
SOLVENT RESISTANT HOLLOW BEADS OF VINYL CHLORIDE COPOLYMERS WITH ETHYLENE AND A NON-CONJUGATED DIENE
Frank Wingler, Leverkusen, Herbert Bartl, Odenthal, Hanenberg, and Robert Zollner, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Apr. 29, 1969, Ser. No. 820,291
Claims priority, application Germany, May 21, 1968, P 17 70 462.0
Int. Cl. C08d *13/08;* C08f *47/10*
U.S. Cl. 260—2.5 B 3 Claims

A solvent resistant hollow bead of ethylene, vinyl chloride and a crosslinking monomer, process of producing the same and the utility of such beads in the production of foams and in coating compositions.

3,630,976
PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE
Alexis Mathieu, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium
No Drawing. Continuation-in-part of application Ser. No. 483,837, Aug. 30, 1965. This application May 2, 1969, Ser. No. 821,467
Claims priority, application Belgium, Sept. 9, 1964, 2,741
Int. Cl. C08f *3/30, 1/11*
U.S. Cl. 260—92.8 W 3 Claims

Vinyl chloride is ploymerized in aqueous suspension in a one step operation by introducing into an aqueous meduim vinyl chloride, a polymerization catalyst and a suspension-forming agent comprised of polyvinyl alcohol and one or more products derived from the condensation of a polyoxyalkylene glycol and a monomeric polyamine. The polyvinyl chloride product is obtained in the form of highly porous granules.

3,630,977
WATER-DILUTABLE PHENOPLASTS HAVING CARBOXYL GROUPS
Bernhard Broecker and Hans-Joachim Kiessling, Hamburg, Germany, assignors to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany
No Drawing. Filed Dec. 2, 1968, Ser. No. 780,583
Claims priority, application Germany, Dec. 8, 1967, P 17 45 353.1
Int. Cl. G08g *37/08*
U.S. Cl. 260—19 14 Claims

Amine salts of phenoplasts carrying carboxylic groups prepared by:

(a) etherifying heat-curable phenol-aldehyde condensation products, such as mononuclear and polynuclear phenols condensed with aldehydes and par-

tially etherified with lower monohydric aliphatic alcohols having 1 to 4 C-atoms, by warming with aliphatic mono- or dihydroxy carboxylic acids having 2 to 20 C-atoms or their esters with alcohols having 1 to 6 C-atoms;

(b) saponifying the condensates having ester groupings in an alkaline medium;

(c) separating the etherified phenolic resin-carboxylic acid; and

(d) mixing the separated phenolic resin-carboxylic acid with ammonia and/or strong organic nitrogen bases.

3,630,978

STABILIZED HALOGEN-CONTAINING ACRYLONITRILE POLYMER COMPOSITION

Iyohiko Nakanome, Kenji Takeya, and Hiroshi Suzuki, Okayama, Japan, assignors to Japan Exlan Company Limited

Filed Sept. 15, 1969, Ser. No. 857,746
Claims priority, application Japan, Sept. 13, 1968, 43/66,388
Int. Cl. C08f *45/62*
U.S. Cl. 260—23 A **12 Claims**

Discoloration of aqueous solutions of acrylonitrile polymers by heat and/or aging, particularly those polymers containing halogen, is prevented by the addition thereto of a combination of a water-soluble inorganic bisulfite and either a triorganophosphite or an organotin carboxylate.

3,630,979

POLYVINYL CHLORIDE STABILIZED WITH SULFUR DIOXIDE COMPLEXES OF ALKALINE EARTH METAL PHENATES

Mark W. Pollock, Teaneck, N.J., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

No Drawing. Filed June 12, 1970, Ser. No. 45,733
Int. Cl. C08f *45/62*
U.S. Cl. 260—23 XA **9 Claims**

This invention provides an alkaline earth metal complex formed by the reaction of alkaline earth metal phenate with an inorganic acid anhydride, in the absence of water. The complex is free from alkaline earth metal in excess of that stoichiometrically required to form the phenate and is free from the salt of the alkaline earth metal and the inorganic acid anhydride. The alkaline earth metal phenate complex has a reduced alkalinity as compared to the alkaline earth metal phenate. This invention also provides a polyvinyl chloride resin stabilizer comprising the alkaline earth metal phenate complex plus any one, or combination, of the following stabilizers: a polyvalent heavy metal salt of an organic carboxylic acid having from two to about eighteen carbon atoms, an organic compound containing at least one epoxy group and having from 10 to 150 carbon atoms, and/or an organic triphosphite. The invention also provides a polyvinyl chloride resin composition containing a combination of the alkaline earth metal phenate complex plus one of the three other stabilizers listed above.

3,630,980

PRESSURE-SENSITIVE HOT MELT ADHESIVES

Thomas E. Russell, Verona, N.J., assignor to The Flintkote Company, White Plains, N.Y.

No Drawing. Filed June 25, 1968, Ser. No. 739,653
Int. Cl. C09j *3/26*
U.S. Cl. 260—27 **11 Claims**

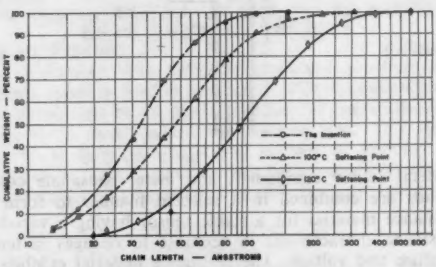
A pressure-sensitive adhesive composition having instant room temperature tack, good cold flow resistance and good shear strength which comprises as a first component a resinous copolymer of ethylene and vinyl acetate, as a second component a resinous rubbery block copolymer of styrene and butadiene or isoprene, and as a third component a modified or unmodified rosin, a coumarone-indene resin, a polyterpene resin, a diene-olefin aliphatic hydrocarbon resin or a polystyrene resin.

3,630,981

COPOLYMERS OF ALPHA METHYL STYRENE AND VINYL TOLUENE AND PROCESS OF PREPARATION

Dean A. Finfinger, Monongahela, and Clarence C. Campbell, Clairton, Pa., assignors to Pennsylvania Industrial Chemical Corporation

Filed June 9, 1969, Ser. No. 831,540
Int. Cl. C08f *45/52, 19/04*
U.S. Cl. 260—28.5 **1 Claim**



Hot melt coating compositions are disclosed which comprise ethylene polymers, paraffin wax, and copolymers of alpha methyl styrene and vinyl toluene, 95% of said copolymers having molecular chain lengths less than 100 angstroms, said copolymer having a Ring and Ball softening point in the range of 90 to 98° C.

3,630,982

SEALING COMPOSITION WITH IMPROVED SEAL EFFICIENCY

James E. Matherly, Elizabethtown, Ky., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Mar. 18, 1970, Ser. No. 20,865
Int. Cl. C08g *51/22, 51/04*
U.S. Cl. 260—29.1 SB **4 Claims**

A mixture of poly-3,3,3-trifluoropropylmethyl-siloxane fluid, poly - 3,3,3 - trifluoropropylmethylsiloxane gum, a silica filler, an extending filler, a polytetrafluoroethylene resin and a polytetrafluoroethylene telomer is useful as a sealing composition, such as for fuel tanks.

3,630,983

YARN SIZES, SIZING TREATMENTS AND RESULTING SIZED YARNS

James C. Pangle, Jr., Danville, Va., and Alton D. Hicks, Mauldin, S.C., assignors to Dan River Inc., Danville, Va.

No Drawing. Continuation-in-part of applications Ser. No. 407,551, Oct. 29, 1964, Ser. No. 491,399, Sept. 29, 1965, and Ser. No. 670,787, Sept. 26, 1967. This application July 12, 1968, Ser. No. 744,292
Int. Cl. C08f *25/00*
U.S. Cl. 260—29.6 **21 Claims**

Textile size compositions which are dispersible in water and comprise an alkali metal and/or ammonium salt of a styrene-maleic anhydride copolymer, copolymerized in the presence of a diester of an olefinically unsaturated dicarboxylic acid or anhydride and a monohydric alcohol and/or a polyester of such an acid or anhydride and a polyhydric alcohol. Also, textile size compositions which are dispersible in water and comprise a mixed salt of a styrene-maleic anhydride copolymer, wherein 20 to 80 weight percent of the cations of said salt are ammonium cations and 20 to 80 weight percent of the cations

of said salt are alkali metal cations. Methods for sizing yarns and yarn sized with the above-mentioned compositions.

3,630,984
LATEXES OF VINYL CYCLOHEXANE-CARBOXYLATE POLYMERS
David P. Sheetz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 18, 1968, Ser. No. 760,734
Int. Cl. C08f *29/38*
U.S. Cl. 260—29.6 TA **7 Claims**

Latexes of vinyl cyclohexanecarboxylate polymers having excellent coating properties such as water resistance, light stability, and hardness.

3,630,985
METHOD OF STABILIZING POLYACRYLONITRILE SPINNING SOLUTIONS
Kenji Takeya, Okayama, and Toshiyuki Kobashi, Tsukubogun, Japan, assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed May 13, 1970, Ser. No. 37,006
Int. Cl. C08f *47/16*
U.S. Cl. 260—29.6 AN **8 Claims**

A process for preparing a stable spinning composition comprising an acrylonitrile polymer dissolved in a concentrated inorganic solvent solution therefor and a surface active agent insoluble in said solution is disclosed which comprises dispersing said surface active agent in said solution, maintaining said dispersion under agitation, and defoaming said dispersion as a film under reduced pressure at a temperature which is at least equal to the boiling point of said composition at the reduced pressure employed.

3,630,986
PROCESS FOR THE PREPARATION OF SOLUTIONS OF ACRYLONITRILE POLYMERS
Andre Mison and Philippe Tarbouriech, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed June 26, 1970, Ser. No. 50,320
Claims priority, application France, June 30, 1969, 6922015
Int. Cl. C08f *45/44, 45/46*
U.S. Cl. 260—30.8 **6 Claims**

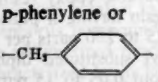
Spinnable acrylonitrile polymer solutions are made by evaporating the water from a thin film of a wet dispersion of the polymer in a solvent therefor having a boiling point higher than water.

3,630,987
LINEAR, SEGMENTED POLYURETHANE ELASTOMERS
Wilhelm Thoma, Bergisch-Neukirchen, Harald Oertel, Odenthal-Glo-Busch, Heinrich Rinke, Leverkusen, and Ulrich Bahr, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Aug. 13, 1970, Ser. No. 63,639
Claims priority, application Germany, Aug. 21, 1969, P 19 42 560.6
Int. Cl. C08g *22/04*
U.S. Cl. 260—32.6 **11 Claims**

Linear, segmented polyurethane elastomers and filaments therefrom, produced by reaction of NCO prepolymers with equivalent amounts of compounds of the formula

$$H_2N—NH—CO—NH—A—CO—NH—NH_2$$

wherein A is m- or p-phenylene or



as chain lengthening agents in polar organic solvents.

3,630,988
WHITE AND COLORABLE FLAME RESISTANT POLYAMIDE
Edward Johnson Deyrup, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Aug. 7, 1970, Ser. No. 62,203
Int. Cl. C08g *51/04, 51/14*; C09k *3/28*
U.S. Cl. 260—37 N **5 Claims**

Polyamides are made sufficiently flame retardant to pass the Underwriters' Laboratory vertical flammability test, SE–1 (subject 746, May 13, 1966) by incorporation into the polyamide from 1–10% by weight of lead borate and an organic halide which is not reactive with the polyamide during melt processing of the polyamide but which reacts with the lead borate and polyamide during pyrolysis of the latter to produce a char, the total additive concentration being from 5 to 30% by weight. The resultant flame retardant polyamide has both good physical properties and is white, which means that the resin can be colored as desired. The resin is especially useful in electrical application such as wire coating.

3,630,989
STABILIZATION OF UNVULCANIZED INTERCONNECTED RUBBERY DIENE POLYMERS WITH A COMPLEX OF AN ARYL BORATE AND A N-ALKYL TRIMETHYLENE DIAMINE
Jerry Donald Hunt, Cuyahoga Falls, and Robert Paul Spitz and Edward Leo Kay, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
No Drawing. Filed June 30, 1969, Ser. No. 837,892
Int. Cl. C08d *9/00, 11/04*
U.S. Cl. 260—33.6 AQ **5 Claims**

An unvulcanized interconnected rubbery homopolymer derived from conjugated dienes of 4 and 5 carbon atoms and copolymers thereof with olefins is stabilized by a complex of equimolar amounts of an aryl borate and N-alkyl trimethylene diamine.

3,630,990
TEXTILE FIBERS
Richard D. Neal, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Jan. 9, 1970, Ser. No. 1,839
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R **14 Claims**

Disclosed is a textile fiber comprising po'y(1,4-cyclohexylene dimethylene terephthalate) having dispersed therein a specific type of precipitated barium sulfate, the barium sulfate having an average particle size of about 0.8 micron. The fibers disclosed are characterized by improved dyeability with disperse dyes and soil-hiding properties. Also disclosed are yarns and fabrics containing the novel fibers of this invention.

3,630,991
OXIDATION INHIBITOR
Henry G. Schutze, Baytown, Tex., and Delos E. Bown, White Plains, N.Y., assignors to Esso Research and Engineering Company, Linden, N.J.
No Drawing. Continuation-in-part of abandoned application Ser. No. 725,896, May 1, 1968, which is a division of applications Ser. No. 343,492, Feb. 10, 1964, now abandoned, and Ser. No. 734,560 June 5, 1968. This application Jan. 7, 1970, Ser. No. 1,306
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.75 R **10 Claims**

A polyolefin composition is stabilized with a sulfur-containing ester compound formed by reacting a sulfur-containing carboxylic acid with an alcohol derived from a resin acid, e.g., tetrahydroabietyl alcohol, dihydroabietyl alcohol, dehydroabietyl alcohol, tetrahydropimaric alcohol, dihydropimaric alcohol, and mixtures thereof.

3,630,992

ORGANOTIN THIOCARBOXYLATES AND PREPARATION THEREOF

Lawrence R. Brecker, Brooklyn, N.Y., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

No Drawing. Filed May 20, 1969, Ser. No. 826,299
Int. Cl. C08f 45/62
U.S. Cl. 260—45.75 K 14 Claims

A process is provided for preparing diorganotin monothiocarboxylates and such diorganotin monothiocarboxylates containing additional groups, including diorganotin monohalide monothio-carboxylates, by reacting a diorganotin sulfide with an acyl halide to form a diorganotin monohalide monothiocarboxylate, and optionally further reacting the diorganotin monohalide monothiocarboxylate with an active hydrogen compound such as (a) a strong inorganic acid to liberate the corresponding free thiol acid; or (b) with a weak organic acid, such as a mercaptan, mercaptoester, thiol acid, or carboxylic acid, or carboxylic acid ester or (c) an alcohol to form a diorganotin monomercaptide monothiocarboxylate, a diorganotin monomercapto acid ester monothiocarboxylate, a diorganotin dithiocarboxylate, a diorganotin monocarboxylate monothiocarboxylate, or a diorganotin monoalcoholate monothiocarboxylate.

Diorganotin monohalide monothiocarboxylates and diorganotin monomercapto acid ester monothiocarboxylates are also provided, as well as polyvinyl chloride resin compositions containing these diorganotin derivatives.

3,630,993

SYNERGISTIC ORGANOTIN STABILIZER COMPOSITIONS AND RESINS STABILIZED THEREWITH

Christian H. Stapfer, Newtown, Pa., assignor to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

No Drawing. Filed Dec. 3, 1968, Ser. No. 780,888
Int. Cl. C08f 45/62
U.S. Cl. 260—45.75 K 4 Claims

An improved stabilizer composition comprises a synergistic combination of an organic thioanhydride and a monohydrocarbyl tin compound of the formula

$$R^3Sn(Z)_n(Z^1R^4)_{3-2n}$$

wherein R^3 is a hydrocarbyl radical having 1 to 12 carbon atoms, Z and Z^1 are either oxygen or sulfur, R^4 is hydrogen or an organic radical bonded to Z^1 by a carbon atom and n is a number from 0 to 1½ varying in increments of ½.

Halide containing resins stabilized with these compositions exhibit improved resistance to the development of early color during processing.

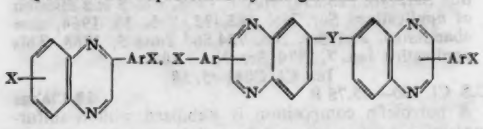
3,630,994

POLYIMIDES PREPARED FROM SUBSTITUTED QUINOXALINES

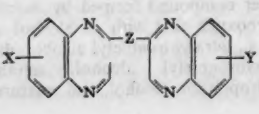
Billy M. Culbertson, Burnsville, Minn., assignor to Ashland Oil & Refining Company, Ashland, Ky.

No Drawing. Application May 27, 1969, Ser. No. 828,356, which is a division of application Ser. No. 539,641, Apr. 4, 1966. Divided and this application Dec. 29, 1969, Ser. No. 1,937
Int. Cl. C08g 20/32
U.S. Cl. 260—47 CP 10 Claims

Quinoxalines represented by the general formula



and



wherein X is nitro or amino, Ar is divalent aromatic hydrocharbon radical, Y is a covalent bond or a divalent linking radical and Z is a divalent radical containing one or two benzene rings. The compositions are useful in the formation of fiber and film forming polyimides and polyamides and in the formation of molding resins.

3,630,995

REMOVAL OF CATALYST RESIDUE FROM POLYPHENYLENE ETHERS

Michael M. Modan, Albany, N.Y., assignor to General Electric Company

Filed Feb. 16, 1970, Ser. No. 11,747
Int. Cl. C08g 23/18
U.S. Cl. 260—47 ET 10 Claims

This invention relates to separation and recovery of copper-amine complex catalyst residues from a reaction stream in a process for the formation of polyphenylene ethers by an oxidative coupling polymerization reaction. The process comprises simultaneously terminating the reaction and extracting catalyst residue by contact of the reaction solution with an aqueous acid solution in a countercurrent, liquid-liquid extraction column. The polymer is then recovered from the reaction solution substantially free of catalyst residue. The amine is recovered from the aqueous acid solution by pH adjustment with alkali and may be re-used if desired. The process of the invention is less expensive than prior art procedures and provides more effective catalyst removal than other commercially acceptable methods.

3,630,996

SINGLE PACKAGE LATENT CURE POLYEPOXIDE SYSTEMS EMPLOYING 2,2'-BI-2-OXAZOLINE OR OXAZINE COPOLYMERIC CURING AGENTS

Donald A. Tomalia, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 833,764, June 16, 1969. This application May 8, 1970, Ser. No. 35,885
Int. Cl. C08g 30/14
U.S. Cl. 260—47 EN 5 Claims

Doubly oxazoline or oxazine terminated alkylene, loweralkylene glycol, polyloweralkylene glycol or their sulfur analogues, combined with curable poly 1,2-epoxyalkyl compounds yield stable, homogeneous single-package compositions of viscosity below that of the starting materials, which can be held for long periods of time uncured, but cure promptly upon heating. The resulting cured epoxy resins are of superior properties including very high resistance to thermal shock, and manifest elastomeric properties, excellent solvent resistance, and desirably high heat distortion temperatures.

3,630,997

CURABLE EPOXY RESIN COMPOSITIONS AND METHOD OF PREPARING SAME

Paul M. Craven, Tokyo, Japan, assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 599,741, Dec. 7, 1966. This application May 4, 1970, Ser. No. 34,523
Int. Cl. C08g 33/10
U.S. Cl. 260—47 EC 6 Claims

This invention relates to novel epoxy resin compositions and to cured products obtained therefrom. More particularly, it relates to curable epoxy resin compositions containing an epoxy resin having a plurality of 1,2 epoxide units, from about 25 to 200 parts per 100 parts of epoxy resin of a thioalkyl substituted diphenyl oxide curing agent and from about 0.05 to 15 parts per 100 parts of epoxy resin of the accelerator tetramethyl guanidine.

3,630,998

PROCESS FOR THE MANUFACTURE OF WATER-SOLUBLE, CURABLE CONDENSATES CONTAINING CARBOXYL GROUPS

Luzius Schibler, Riehen, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,912
Claims priority, application Switzerland, Oct. 13, 1967, 14,309/67
Int. Cl. C08g 9/30, 9/34, 9/10
U.S. Cl. 260—67.6 R 10 Claims

The present invention provides a process for the manufacture of water-soluble, curable condensates containing carboxyl groups, wherein the methylol groups of aminoplast precondensates are etherified with monohydroxy compounds and aliphatic hydroxycarboxylic acid esters and then the carboxylic acid ester groups are hydrolyzed in an alkaline medium. The condensates are useful reactive tensides.

3,630,999

TETRASUBSTITUTED UREA MONOMERS AND POLYMERS

Daniel A. Dimmig, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed Nov. 12, 1969, Ser. No. 876,134
Int. Cl. C08g 22/02; C07d 29/24
U.S. Cl. 260—77.5 C 12 Claims

Difunctional monomers containing a tetrasubstituted urea linkage are prepared and used to prepare condensation polymers having a tetrasubstituted urea group in the polymer chain. The polymers have enhanced thermal stability because degradative reactions involving the urea hydrogen atoms are not possible. The polymers are film forming materials and have high melting points.

3,631,000

ISOCYANURATE-CONTAINING POLYISOCYANATES AND METHOD OF PREPARATION

Perry A. Argabright and Brian L. Phillips, Littleton, Colo., and Vernon J. Sinkey, South St. Paul, Minn., assignors to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed June 4, 1969, Ser. No. 830,541
Int. Cl. C08g 22/18, 22/44
U.S. Cl. 260—77.5 NC 11 Claims

Improved organic polyisocyanates are prepared by reacting chlorinated benzene-substituted compounds, especially chloromethylated aromatics, with metal cyanates in the presence of a metal iodide or bromide and in the presence of a dipolar aprotic solvent where the mole ratio of cyanate in the metal cyanate to chlorine in the chlorine-containing benzene-substituted compound is from about 0.8 to about 1.5. The polyisocyanate compositions are useful as starting materials in the production of flame-retardant urethane polymers as coatings, films, foams, adhesives, etc.

3,631,001

PROCESS FOR PREPARING POLYCAPROLACTAM

Soji Arakawa and Koichi Matuya, Uji-shi, Yasuro Kobayashi, Kyoto-shi, and Minoru Matsushita and Toshiko Tukamoto, Uji-shi, Japan, assignors to Nippon Rayon Kabushiki Kaisha, Uji-shi, Kyoto-fu, Japan

No Drawing. Filed Jan. 22, 1969, Ser. No. 793,154
Claims priority, application Japan, Jan. 24, 1968, 43/4,201
Int. Cl. C08g 20/18
U.S. Cl. 260—78 L 9 Claims

This invention relates to a process for preparing polycaprolactam, in which ε-caprolactam is polymerized in the presence of an alkali-type catalyst to form a polymer and one or more phosphorus compounds are then added to said polymer. The polymerized product of ε-caprolactam thus formed is characterized by its lack of the diminution of the viscosity in the molten state.

3,631,002

POLYMERIZATION OF OLEFINS

Sydney K. Brownstein, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

No Drawing. Filed Dec. 26, 1968, Ser. No. 787,201
Int. Cl. C08d 3/04
U.S. Cl. 260—80.78 15 Claims

Polymerization of olefins e.g. ethylene and propylene with a cationic catalyst of carbonium ions stabilized with polyfluoro pentavalent antimony or arsenic anions, at low temperatures e.g. —20 to —90° C., and branched polymer of ethylene.

3,631,003

POLYAMIDES AND THEIR PRODUCTION

Isaac Goodman and Michael Edward Benet Jones, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation of abandoned application Ser. No. 655,275, July 24, 1967. This application Feb. 24, 1970, Ser. No. 14,754
Claims priority, application Great Britain, Aug. 3, 1966, 34,802/66, 34,803/66, 34,804/66, 34,805/66, 34,806/66
Int. Cl. C08g 20/20
U.S. Cl. 260—78 R 12 Claims

Polyamides of specified minimum molecular weight having at least 50 mole percent of their repeating units, units derived from diaminodiphenyl sulphones and straight-chain α,ω-alkane dicarboxylic acids having at least 6 carbon atoms, including the carboxy carbon atoms, useful as structural polymers.

Also, a process for the preparation of such polyamides which comprises treating a diaminodiphenyl sulphone with the diacid halide of an α,ω-alkanedicarboxylic acid at or below room temperature in the presence of an organic solvent. The polyamides are useful in the manufacture of molded articles, films, fibers and the like.

3,631,004

PROCESS FOR THE PRODUCTION AND THE RING-OPENING POLYMERIZATION OF 3-AZABICYCLO (3,2,2)NONANONE - 2 AND THE POLYAMIDE OBTAINED THEREBY

Shinpei Gomi, Tokyo, Shigeyuki Suzuki, Kanagawa-ken, and Hitoshi Takita, Masaaki Takahashi, and Kiro Asano, Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1968, Ser. No. 785,557
Claims priority, application Japan, Dec. 28, 1967, 43/83,676; Dec. 29, 1967, 43/84,712, 43/84,713
Int. Cl. C08g 20/10, 20/12
U.S. Cl. 260—78 L 12 Claims

This invention is a process for producing 3-azabicyclo (3,2,2) nonanone-2 by reacting nitrosyl surfuric acid with bicyclo (2,2,2) octane-2-carboxylic acid in presence of fuming sulfuric acid, process for polymerizing 3-azabicyclo (3,2,2) nonanone-2 or for copolymerization 3-azabicyclo (3,2,2) nonanone with ε-caprolactam, and polyamides and copolyamides obtained thereby.

3,631,005

N,N'-BIS(ISOMALEIMIDE) POLYHYDRAZIDES

You-Ling Fan, East Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Jan. 29, 1969, Ser. No. 795,075
Int. Cl. C08g 20/20
U.S. Cl. 260—78 UA 3 Claims

High molecular weight polyhydrazides have been prepared successfully by allowing equimolar amounts of N,N'-bis(isomaleimide) and dihydrazides to react in a highly polar solvent at room temperature. Both aliphatic and aromatic polyhydrazides are amorphous resins with

glass transition temperatures about 100° C. They exhibit excellent oxygen barrier properties, very high dielectric constants and fairly good mechanical properties.

3,631,006

PROCESS FOR THE ANIONIC POLYMERIZATION OF UNSATURATED HYDROCARBON MONOMERS

John J. Hawkins, Santa Ana, Calif., assignor to Cities Service Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 484,430, Sept. 1, 1965. This application Sept. 23, 1969, Ser. No. 860,471

Int. Cl. C08d *3/06;* C08f *1/28*

U.S. Cl. 260—80.7 5 Claims

The disclosure is concerned with a new method of effecting the anionic polymerization of polymerizable unsaturated hydrocarbon monomers, wherein a catalyst-cocatalyst combination is used. The catalyst-cocatalyst combination consists of (a) an anionic catalyst of a Group I–A or II–A metal, and (b) a compound of a Group III–A element as the cocatalyst.

3,631,007

REMOVAL OF VANADIUM RESIDUES FROM ETHYLENE COPOLYMERS

Bart A. Diliddo, Seven Hills, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Oct. 31, 1968, Ser. No. 772,355

Int. Cl. C08f *1/88, 15/40*

U.S. Cl. 260—80.78 9 Claims

In a process whereby ethylene is copolymerized with a polyene under pressure with a vanadium catalyst to form amorphous vulcanizable elastomers, the vanadium compound content of said polymer is reduced and the color of the polymer improved by contacting at a higher pressure a polymerization effluent containing the ethylene copolymer and vanadium catalyst with a low molecular weight alcohol or ketone and thereafter washing this mixture under pressure with hydrocarbon and/or water to remove the residual vanadium compound.

3,631,008

ODD/EVEN COPOLYMERS

Roger D. A. Lipman, Yonkers, N.Y., assignor to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 621,451, Mar. 8, 1967. This application Apr. 24, 1968, Ser. No. 723,913

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.78 5 Claims

Sticky, semi-solid copolymers of three or more alpha olefins useful as pour point depressants or adhesives are disclosed, the copolymers being composed of monomer residues having both odd and even numbers of carbon atoms and having specified side chain lengths.

3,631,009

POLYMERIZATION INITIATOR ACTIVATOR SALTS

Glen E. Meyer, Kent, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of abandoned application Ser. No. 697,600, Jan. 15, 1968. This application Feb. 24, 1970, Ser. No. 14,749

Int. Cl. C08d *1/00, 1/12, 1/20*

U.S. Cl. 260—82.3 8 Claims

Discloses the use of initiator activators in the polymerization of an ethylenically unsaturated monomer capable of being polymerized by hydrogen peroxide and organic hydroperoxide catalysts in a mutual solvent polymerization system, mutual solvents being lower alcohols, acetone, methyl ethyl ketone, dioxane and tetrahydrofuran, the initiator activators being soluble in the non-aqueous mutual solvent by at least 2% and being a chloride, bromide, nitrate, thiocyanate or sulfate salt of magnesium, lithium, calcium, zinc, potassium, strontium, ammonia, quaternary ammonia, and hydrochloric and hydrobromic acid salts of primary, secondary and tertiary amines.

3,631,010

PROCESS FOR THE PRODUCTION OF TRANS-POLYPENTENAMERS

Josef Witte, Cologne-Stammheim, and Nikolaus Schon and Gottfried Pampus, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 9, 1969, Ser. No. 826,062

Claims priority, application Germany, May 24, 1968, P 17 70 491.5

Int. Cl. C08d *3/04;* C08f *7/02*

U.S. Cl. 260—82.1 4 Claims

A process for the production of cyclopentene-polymers having predominantly transconfiguration by the polymerisation of cyclopentene in solution in inert solvents in the presence of a mixed catalyst of

(a) a tungsten salt,
(b) a halogenated alcohol in which the halogen atom and the hydroxyl group are attached to adjacent carbon atoms, and/or a halogenated phenol, and
(c) an organic aluminium compound,

in the molar ratio of *a*:*b*:*c* of 1:0.3 to 10:0.5 to 15.

3,631,011

METHOD FOR POLYMERIZING ETHYLENE BY USE OF NOVEL CATALYST SYSTEM

Kenichi Maemoto, Takatsuki-shi, Takezo Sano, Ibaragi-shi, and Katsuji Ueno, Hirakata-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,378

Claims priority, application Japan, Dec. 28, 1967, 42/84,962

Int. Cl. C08d *3/02;* C08f *15/04*

U.S. Cl. 260—85.3 4 Claims

A process for the homopolymerization of ethylene and copolymerization of ethylene with olefins or diolefins using a catalyst composed of (1) a reaction product of an orthovanadate compound with a phosphoric acid or its derivative, and (2) an organo-aluminum compound having the formula,

$$R_nAlX_{3-n}$$

wherein R is a hydrocarbon group having from 1 to 8 carbon atoms; X is a hydrogen or halogen atom or an alkoxy group; and *n* is a positive number not more than 3.

3,631,012

PROCESS FOR PREVENTING OR REDUCING DEPOSITS AND CLOGGING IN THE CONTINUOUS POLYMERIZATION AND COPOLYMERIZATION OF OLEFINS BY THE LOW PRESSURE PROCESS

Franz Zapf, Kelkheim, Taunus, Wilhelm Dummer, Wiesbaden, and Gunther Lehmann, Neuenhain, Taunus, Germany, assignors to Hercules Incorporated, Wilmington, Del.

Filed June 4, 1968, Ser. No. 734,380

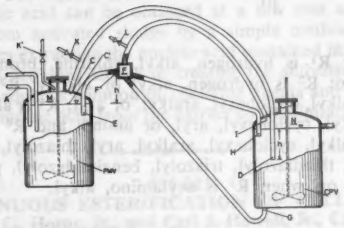
Claims priority, application Germany, June 15, 1967, F 52,690

Int. Cl. C08f *1/42, 1/98*

U.S. Cl. 260—85.3 10 Claims

The present invention relates to a process for preventing or reducing deposits and clogging in the continuous polymerization and copolymerization of olefins by the low pressure process, especially when partially wax-like or sticky products are obtained, in an apparatus comprising at least one main polymerization vessel and at least one

continued-polymerization vessel connected in series, both being connected by a system of definitely arranged gas outlet and reaction mixture discharge pipes. The portion of the monomer or monomer mixture, which does not react under the polymerization conditions is continuously withdrawn from the gas space of the main polymerization



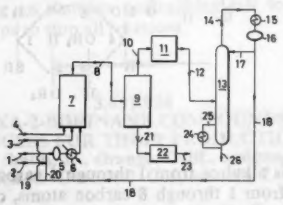
vessel and introduced into another vessel together with the liquid reaction mixture to complete the polymerization. The gas space in the polymerization vessel is maintained as small and, especially, as constant as possible by the geometry of the apparatus and siphoning-over of the liquid reaction mixture is moreover prevented.

3,631,013

METHOD FOR MAKING SOLID RUBBERY COPOLYMERS OR ISOOLEFINS AND DIOLEFIN

Tatsuo Horie, Tokyo, Japan, assignor to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1968, Ser. No. 757,389
Claims priority, application Japan, Sept. 10, 1967, 42/57,776
Int. Cl. C08d *3/06, 3/10*
U.S. Cl. 260—85.3 **6 Claims**



A method for making solid rubbery materials by copolymerizing an isoolefin and a diolefin in an alkyl halide as solvent with boron trifluoride and a metal compounds $M(OR)_mX_n$ as catalyst wherein M is Al or Ti, R is a hydrocarbon radical or a halogenated derivatives thereof, X is a halogen, which comprises introducing monomers, recycled solvent defined as follows, metal compound $M(OR)_mX_n$ and boron trifluoride into the polymerization reactor and carrying out polymerization reaction at a temperature below 0° C., preferably from −50° C. to −110° C., and withdrawing polymerized mixture continuously from the polymerization reactor, bringing said mixture into contact with a heating medium to evaporate and separate low boiling fraction mainly containing the solvent and unreacted monomers from the polymer produced, drying and fractionating said low boiling fraction to distil the solvent containing the unreacted monomer, recycling said solvent, wherein said boron trifluoride introduced into the reaction system is not previously mixed with said recycled solvent or the monomers.

3,631,014

SUSPENSION POLYMERIZATION PROCESS

Harold A. Wright, Murrysville, Pa., assignor to Sinclair-Koppers Company

Continuation-in-part of application Ser. No. 641,596, May 26, 1967. This application Oct. 14, 1969, Ser. No. 868,286
Int. Cl. C08f *1/11, 7/04*
U.S. Cl. 260—93.5 W **4 Claims**

The production of polymer particles or beads by suspending, as droplets, a vinyl aromatic monomer having a free radical generating catalyst dissolved therein, in an aqueous medium with the aid of a finely divided phosphate suspending agent and heating the suspension to cause the monomer to polymerize into polymer particles is improved by adding to the suspension at least about 0.0003 percent by weight based on monomer of sodium bisulfite to the suspension before the droplets reach the bead identity point.

3,631,015

TRIARYLPHOSPHINE, ALKYLLITHIUM, AND 1,3 - DIHALOBENZENE POLYMERIZATION INITIATOR FOR CONJUGATED DIENE POLYMERIZATION

William J. Trepka, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Mar. 6, 1970, Ser. No. 17,310
Int. Cl. C08d *3/04;* **C08f** *3/16*
U.S. Cl. 260—94.2 M **4 Claims**

A method of manufacturing high cis-polydienes by polymerizing a conjugated diene with an initiator prepared by reacting a triarylphosphine, an alkyllithium and a 1,3-dihalobenzene.

3,631,016

PROCESS FOR IMPROVING THE STABILITY OF CIS-1,4-POLYISOPRENE VULCANISATES

Josef Witte, Cologne-Stammheim, Friedrich Haas, Cologne-Buchheim, and Gottfried Pampus, Egon Kuntz, and Nikolaus Schon, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of application Ser. No. 771,663, Oct. 29, 1968. This application July 20, 1970, Ser. No. 64,023
Int. Cl. C08d *3/12, 5/02*
U.S. Cl. 260—94.7 N **3 Claims**

Process for improving the stability of cis-1,4-polyisoprene vulcanisates by inactivating a catalyst containing solution of polyisoprene in an organic solvent with a mixture comprising a lower aliphatic alcohol, a conventional stabiliser and a small quantity of an aliphatic or cycloaliphatic secondary amine whose alkyl or cycloalkyl radicals together contain at least 10 carbon atoms.

3,631,017

AFTER-TREATING POLYETHYLENE IN A SHEARING UNIT

August Rettig, Ludwigshafen, Wolfgang Ball, Mannheim, Johann Zizlsperger, Frankenthal, and Friedrich Urban and Helmut Pfannmueller, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Jan. 27, 1970, Ser. No. 6,303
Claims priority, application Germany, Jan. 31, 1969, P 19 04 739.3
Int. Cl. C08f *27/00, 27/28*
U.S. Cl. 260—94.9 **4 Claims**

A method of after-treating high-pressure polyethylene in a shearing unit, wherein the high-pressure polyethylene is introduced into the shearing unit at 200° to 300° C. and a viscosity of 5×10^3 to 1×10^5 poises and subjected to a shearing gradient, the shearing surfaces contacting

the polyethylene melt being heated to a temperature which is at least as high as that of the polyethylene melt and the polyethylene melt being sheared at such a shearing speed that the product of shearing speed and residence time in the shearing zone is equal to 5×10^2 to 5×10^4.

3,631,018

PRODUCTION OF STABLE HIGH-POTENCY HUMAN AHF USING POLYETHYLENE GLYCOL AND GLYCINE TO FRACTIONATE A CRYOPRECIPITATE OF AHF CONCENTRATE

Edward Shanbrom, Santa Ana, and Lajos F. Fekete, Costa Mesa, Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Continuation of application Ser. No. 679,240, Oct. 30, 1967, which is a continuation-in-part of application Ser. No. 634,839, May 1, 1967. This application May 1, 1970, Ser. No. 31,862

Int. Cl. A23j *1/06;* C07g *7/00*

U.S. Cl. 260—112 B 8 Claims

The production of a stable antihemophilic factor of high potency by the fractionation of a cryoprecipitate concentrate of antihemophilic factor.

3,631,019

CONTINUOUS PROCESS FOR SULFURIZING POLYBUTENES

Marvin J. Den Herder, Olympia Fields, and Arthur C. Borg, Chicago, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Oct. 17, 1968, Ser. No. 768,296

Int. Cl. C07g *17/00*

U.S. Cl. 260—139 4 Claims

A continuous process for sulfurizing polybutenes for use in metal working lubricants, and a reactor for use in carrying out the continuous process, including introducing molten sulfur and polybutenes into an enclosed chamber where flow therethrough is intercepted to provide a series of reaction zones, mixing to provide intimate contact in at least each zone situated in the initial one third of the chamber volume, recycling sulfur collecting on the bottom of at least the zones in the initial one third of the volume, allowing flow from one zone to another, maintaining the chamber at from 300° F. to 400° F. and coordinating the various flow rates and the chamber volume with the reaction temperature to provide a predetermined chamber residence time.

3,631,020

MONOAZO COMPOUNDS CONTAINING A HYDROCARBYL SULFONAMIDOALKYL ANILINE COUPLING COMPONENT

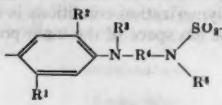
Max A. Weaver and David J. Wallace, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 567,062 and Ser. No. 567,082, both July 22, 1966. This application Sept. 27, 1968, Ser. No. 763,401

Int. Cl. C09b *29/00;* D06p *1/04, 3/52*

U.S. Cl. 260—158 11 Claims

Monoazo compounds which are particularly useful for dyeing polyester textile materials, exhibiting thereon excellent fastness to light and resistance to sublimation, have a heterocyclic diazo component and a coupling component having the formula



in which R^1 is hydrogen, alkyl, chlorine, bromine or acylamino; R^2 is hydrogen, alkyl or alkoxy; R^3 is hydrogen, alkyl, cyclohexyl, aralkyl, or aryl; R^4 is alkylene; R^5 is alkyl, cyclohexyl, aryl, or amino; and R^6 is substituted alkyl, cyclohexyl, aralkyl, aryl, thiazolyl, benzothiazolyl, thiadiazolyl, triazolyl, benzimidazolyl, pyridyl, quirolyl, or, when R^1 is acylamino, alkyl.

3,631,021

7-HALO LINCOMYCIN CARBONATE ESTERS

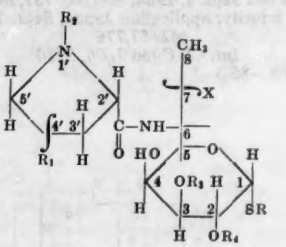
Anthony A. Sinkula, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Apr. 15, 1969, Ser. No. 816,417

Int. Cl. C07c *47/18*

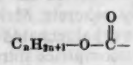
U.S. Cl. 260—210 R 25 Claims

This invention relates to novel 3-mono(alkyl carbonate) and 2,3-bis(alkyl carbonate) esters of 7-halogenated lincomycin compounds of the formula



I

wherein R is alkyl of from 1 through 6 carbon atoms; R_1 is alkyl of from 1 through 8 carbon atoms, cycloalkyl of from 3 through 8 carbon atoms, or aralkyl of up to 12 carbon atoms; R_2 is hydrogen or alkyl of from 1 through 8 carbon atoms; X is chlorine, bromine or iodine; R_3 is



wherein *n* is an integer from 1 through 20 and R_4 is R_3 or hydrogen; their acid addition salts; and novel synthesis processes.

These alkyl carbonate esters of lincomycin compounds have antibiotic activity. For example, the 3-mono(alkyl carbonate) esters can be used to inhibit the growth of *Staphylococcus aureus, Streptococcus hemolyticus* and *Streptococcus faecalis* on medial and dental equipment contaminated with these bacteria. The 2,3-bis(hexyl carbonate) ester of 7-deoxy-7(S)-chlorolincomycin is advantageous for oral administration as an antibiotic in that it lacks the bitter taste of the unesterified compound.

3,631,022
METHOD OF EXTRACTING NUCLEIC ACID FROM ACTIVATED SLUDGE

Mitsuo Kuriyama and Syozo Nishikawa, Yokohama-shi, Japan, assignors to Kurita Water Industries Ltd., Higashi-ku, Osaka-shi, Japan

No Drawing. Filed May 22, 1969, Ser. No. 827,060
Int. Cl. C07d *51/50*
U.S. Cl. 260—211.5 R 10 Claims

Nucleic acid can be obtained at a low cost and high yield from activated sludge by a simple method which comprises extracting the nucleic acid contained in the mucilage of activated sludge by treating the activated sludge with an aqueous solution of chelating agents and separating the nucleic acid from the extract by precipitation.

3,631,023
CONTINUOUS ESTERIFICATION OF CELLULOSE

Charles G. Horne, Jr., and Carl J. Howell, Jr., Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,028
Int. Cl. C08b *3/10, 3/30*
U.S. Cl. 260—229 12 Claims

Continuously esterified cellulose flake having a low standard derivation in viscosity, a low standard derivation in acetyl value and a low percentage of combined sulfates are produced by a continuous process comprising the following steps:

(1) slurrying cellulose in a lower fatty acid/water slurry;
(2) washing said slurry with lower fatty acid and extracting water from the cellulose slurry;
(3) adding an effective amount of an acid catalyst;
(4) mixing the pretreated cellulose containing the lower fatty acid and catalyst with a lower fatty acid/lower fatty acid anhydride mixture containing excess anhydride and esterifying the cellulose mixture;
(5) blending the esterified dope with an aqueous solution of neutralizing salt;
(6) desulfating the partially neutralized acetylated dope; and
(7) adding an aqueous neutralizing salt to the desulfated dope to stop all reactions.

3,631,024
1,3-DIOXA-2-BORINANE COMPOUNDS AND PROCESS FOR THEIR PRODUCTION

Hampton D. Smith, Jr., Orange, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 710,764, Mar. 6, 1968. This application Mar. 4, 1970, Ser. No. 16,578
Int. Cl. C07d *107/02*
U.S. Cl. 260—239 E 9 Claims

2-(N-aziridinyl)-1,3-dioxa-2-borinane compounds having alkyl substituents on the dioxaborinane ring are provided. The compounds are readily prepared by reaction of aziridine with the corresponding alkyl-substituted 1,3-dioxa-2-borinane. They are useful as curing agents for epoxy resins.

3,631,025
POLYOL MONO-(ACIDIC LIPID) ESTERS

James B. Martin, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 16, 1969, Ser. No. 825,409
Int. Cl. C07c *69/32*
U.S. Cl. 260—234 R 9 Claims

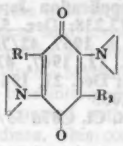
Novel polyol mono-(acidic lipid) esters are useful as emulsifiers, as frying fat antispatter additives, and as cake volume increasers. Examples of the novel compounds include 1,2-distearin succinatyl-1-glycerol, 1,2-distearin succinatyl-1-xylitol, 1,2-distearin succinatyl-1-sorbitol, 1-stearoyl propylene glycol succinatyl-1-sorbitol, and 1,2-distearin succinatyl sucrose.

3,631,026
2,5-BIS(1-AZIRIDINYL)-1,4-BENZOQUINONE DERIVATIVES

Hideo Nakao, Masao Arakawa, and Takahiro Nakamura, Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,564
Claims priority, application Japan, Jan. 29, 1968, 43/5,315; Dec. 28, 1968, 44/331
Int. Cl. C07d *23/06*
U.S. Cl. 260—239 EQ 10 Claims

New 2,5-bis(1-aziridinyl) - 3,6-disubstituted-1,4-benzoquinone compounds are provided having the formula



wherein R_1 is alkyl of 1 to 5 carbon atoms and R_2 is a 2-carbamoyloxyethyl group, the ethyl moiety of which may be substituted with alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms at 1-position or alkyl of 1 to 5 carbon atoms at 2-position; or both R_1 and R_2 represent a 2-N,N-di(alkyl)-carbamoyloxyethyl group having 1 to 5 carbon atoms in each alkyl moiety, 2-hydroxyethyl or a 2-alkoxyethyl group having 1 to 5 carbon atoms in the alkoxy moiety.

These new benzoquinone compounds are proved to exert an excellent antileukemic activity, for example, as studied on lymphoid leukemia L 1210 in mice and thus they can be used for human beings as a drug for the remission and treatment of various types and severities of leukemia.

They are prepared from the corresponding 1,4-benzoquinone compounds by the reaction with aziridine.

3,631,027
CEPHALOSPORANIC ACIDS

Leonard Bruce Crast, Jr., Clay, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,440
Int. Cl. C07d *99/24*
U.S. Cl. 260—239.1 6 Claims

7-[α-(1-substituted)-3 or 4-pyridylthio)acetamido] cephalosporanic acid betaines are valuable antibacterial agents for use in mammals, including man. The compound 7-[α-(1-methyl-4-pyridylthio)acetamido]cephalosporanic acid betaine is of particular interest for its excellent antibacterial spectrum and potency. The compound is prepared by mixing together equimolar quantities of 7 - [α - (4-pyridylthio)acetamido]cephalosporanic acid and methyl iodide in the presence of a tertiary amine.

3,631,028
PROCESS FOR PRODUCING 6-ACYLAMINO-PENICILLANIC ACIDS

Yukichi Kishida, Junichi Nakazawa, Hidebumi Matsuda, Yoshio Sato, Toshihide Miyamura, and Takako Watatani, Tokyo, Japan, and Mitsuo Watatani, deceased, late of Tokyo, Japan, by Takako Watatani, heiress, Yokohama, and Tetsuo Hiraoka, Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

No Drawing. Filed Nov. 4, 1969, Ser. No. 874,048
Claims priority, application Japan, Nov. 6, 1968, 43/81,125
Int. Cl. C07d *99/24*
U.S. Cl. 260—239.1 9 Claims

An improved process for the production of 6-acylaminopenicillanic acids comprises forming 6-salicylidene-

aminopenicillanic acid-salicylaldehyde adduct by adding to a fermented broth containing 6-aminopenicillanic acid two moles or more of salicylaldehyde per mole of said 6-aminopenicillanic acid, and then acylating the said adduct.

3,631,029

PROCESS FOR PRODUCING BENZODIAZEPINE DERIVATIVES

Hisao Yamamoto, Nishinomiya-shi, Shigeho Inaba, Takarazuka-shi, Tadashi Okamoto, Ashiya-shi, Toshiyuki Hirohashi, Kobe, Kikuo Ishizumi and Michihiro Yamamoto, Takarazuka-shi, Isamu Maruyama, Minoo-shi, Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Nov. 22, 1968, Ser. No. 778,348

Claims priority, application Japan, Dec. 1, 1967, 42/77,234, 42/77,238; Dec. 5, 1967, 42/78,270, 42/78,271; Dec. 6, 1967, 42/78575; Dec. 9 1967, 42/79,166; Dec. 12, 1967, 42/79,924; Dec. 15, 1967, 42/80,514; Dec. 21, 1967, 42/82,273; Mar. 11, 1968, 43/16,033

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 **17 Claims**

1-substituted or unsubstituted 5-phenyl-benzodiazepine-2-ones are produced with commercial advantage through ring expansion by oxydation of N-substituted or unsubstituted-2-aminomethyl-3-phenyl-indoles. The starting 2-aminomethyl-indoles are prepared by subjecting indole-2-carboxylic acids either to direct amination with ammonia or to halogenation and then amination with ammonia, reducing the yielding indole-2-carbonamides to 2-cyano-indoles and hydrogenating the cyano indoles, provided that when N-unsubstituted-indoles are used the substitution may be effected optionally in any time before or after the above procedures.

3,631,030

PRODUCTION OF ε-CAPROLACTAM

Karl-Siegfried Brenner, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Jan. 6, 1970, Ser. No. 1,037

Claims priority, application Germany, Jan. 18, 1969, P 19 02 458.9

Int. Cl. C07d *41/06*

U.S. Cl. 260—239.3 A **5 Claims**

Production of caprolactam by catalytic rearrangement of cyclohexanone oxime in the vapor phase in contact with boric oxide catalysts on alumina which contain from 0.1 to 10% by weight of manganese, nickel and/or cobalt or as the salts oxides of such metals. Caprolactam is useful for the production of nylon 6 which is a fiber intermediate.

3,631,031

INTERMEDIATE USEFUL IN THE SYNTHESIS OF ALDOSTERONE

Eiji Kondo, Ikeda-shi, Takashi Mitsugi, Senboku-gun, and Kazuo Tori, Kobe-shi, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 555,220, June 6, 1966. This application Jan. 13, 1969, Ser. No. 790,834

Claims priority, application Japan, June 11, 1965, 40/34,820, 40/34,821, 40/34,822

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 **2 Claims**

Corticosterone or esters thereof is treated with the enzymes of Corynespora fugnus to obtain novel 18-hydroxycorticosterone inter- and/or intra-molecular acetals and/or acylates thereof accompanied with several monohydroxycorticosterones, then the product is treated with acid or mixture of acid and acylating agent to form ether bridge between positions 11 and 18, finally the 18-deoxyaldosterone derivatives obtained are treated again with the enzymes of Corynespora fungus to prepare aldosterone, 18-dehydroaldosterone, 9α-hydroxy-11β,18-epoxy-4-androstene-3,17-dione.

3,631,032

3-ALKOXYMETHYLENOXY ETHERS OF PREGNANES AND 19-NORPREGNANES AND THEIR PREPARATION

John H. Fried, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Filed Apr. 16, 1969, Ser. No. 816,828

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 D **14 Claims**

This discloses 3-alkoxymethylenoxy ethers of the pregnane and 19-norpregnane series of steroids wherein the the alkoxy portion has from 1 to 4 carbon atoms, inclusive. The remainder of the pregnane or 19-norpregnane steroid molecule can be substituted and/or unsaturated at one or more of positions C–6, 7, C–10, C–16, and C–17α. These compounds are useful are progestational agents. Also taught are methods useful for the preparation of these compounds.

3,631,033

STEROIDS

Giangiacomo Nathansohn and Giorgio Winters, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

No Drawing. Filed May 1, 1969, Ser. No. 821,149

Claims priority, application Italy, May 3, 1968, 16,029/68

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 **18 Claims**

Compounds selected from 16α-hydroxy-17α-amino-steroides, steroido-[17α,16α-d]-oxazolidines and steroido-[17α,16α-d]-oxazolidino-[3',4'-c] - 2H - tetrahydro-1,3-oxazine-2''-ones. The second and third classes of steroids are active as anti-inflammatory agents and progestinic.

3,631,034

DERIVATIVES OF 5-CINNAMOYL BENZOFURAN, THEIR PROCESS OF PREPARATION AND THEIR THERAPEUTIC UTILIZATION

Claude P. Fauran, 5 Rue Lebouteaux, and Guy M. Raynaud, 39 Rue Saint-Georges, both of Paris, France; Jeannine A. Eberle, 106C Rue Leon Barbier, Chatou, France; and Bernard M. Pourrias, 36 Allee-du-Mail, Meudon-la-Foret, France

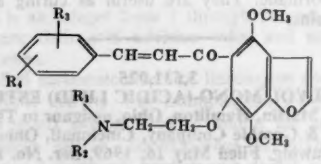
No Drawing. Filed June 27, 1969, Ser. No. 837,342

Claims priority, application Great Britain, July 6, 1968, 32,383/68

Int. Cl. C07d *5/36*

U.S. Cl. 260—240 J **6 Claims**

Compounds of the formula



in which R_1 and R_2 each are

(1) an alkyl radical having 1 to 4 carbon atoms, or

(2) together with the nitrogen atom to which they are attached for heterocyclic radical

R_3 and R_4 represent a hydrogen atom, an alkyl radical having 1–5 carbon atoms, a halogen atom, an alkoxy radical or a trifluoromethyl radical.

The compounds are made by reacting, in an alkaline medium and in an alcoholic solvent, an ether amine of khellinone with an aromatic aldehyde. The compounds exhibit hypotensive activity, vasodilatory activity, spasmolytic activity and an effect on the capillary permeability.

3,631,035

2-VINYL-1,4-DIHYDROQUINAZOLINE DERIVATIVES

David A. Cox, Sandwich, Kent, England, assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Apr. 2, 1969, Ser. No. 812,910
Int. Cl. C07d *51/48*
U.S. Cl. 260—240 D 10 Claims

A series of novel 1,4-disubstituted-2-vinyl-1,4-dihydroquinazoline derivatives, including their pharmaceutically acceptable acid addition salts, have been prepared using various alternate synthetic routes. These compounds are useful in the effective control and/or prevention of thrombosis. Trans-1,4-dimethyl-2-styryl-1,4-dihydroquinazoline and trans - 1 - methyl-2-styryl-4-phenyl-1,4-dihydroquinazoline are preferred embodiments.

3,631,036

5-AMINO-2,6-SUBSTITUTED-7H-PYRROLO[2,3-*d*] PYRIMIDINES AND RELATED COMPOUNDS

Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 4, 1969, Ser. No. 874,052
Int. Cl. C07d *57/14*
U.S. Cl. 260—247.2 A 8 Claims

The disclosure is directed to 5-amino-2,6-substituted-7H-pyrrolo[2,3-*d*]pyrimidines and related compounds and to 4-halo-5-pyrimidinecarbonitriles and their derivatives. The compounds have central nervous system activity as depressants. That is, they produce a calming effect in the host.

3,631,037

1-SUBSTITUTED-2,5-DIPHENYLPYRROLES

Robert Louis Duncan, Jr., and William J. Welstead, Jr., Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed June 21, 1968, Ser. No. 738,781
Int. Cl. C07d *27/26, 87/38*
U.S. Cl. 260—247 4 Claims

1-substituted - 2,5 - diphenylpyrroles having analgetic activity are disclosed. The novel compounds are prepared by cyclization of 1,2-dibenzoylethane with amines and alkylation of 2,5-diphenylpyrroles.

3,631,038

PRODUCTION OF 6-ALKOXYPYRIDAZINIUM COMPOUNDS

Franz Reicheneder and Rudolf Kropp, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,690
Claims priority, application Germany, Mar. 14, 1969, P 19 12 941.0
Int. Cl. C07d *51/04*
U.S. Cl. 260—247.5 R 5 Claims

Production of 6-alkoxypyridazinium compounds by reaction of pyridazone-(6) with alkylating agents, and new substances of this type. The new compounds are pharmaceuticals and starting materials for the production of dyes, pharmaceuticals and pesticides.

3,631,039

2-AMINO ETHYL-2-HYDROXY - 6-VINYL TETRAHYDROPYRANS, TAUTOMERS AND OPTICAL ENANTIOMERS THEREOF

David Andrews, Nutley, and Gabriel Saucy, Essex Fells, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,142
Int. Cl. C07d *87/32*
U.S. Cl. 260—247.7 A 8 Claims

Multi-step processes for the preparation of tricyclic intermediates useful in the total synthesis of steroids are described. A first process step involves treatment of a dihydroxy, divinyl compound with both manganese dioxide and an amine to produce a Mannich base intermediate. The resulting Mannich base intermediate may be reduced catalytically and then coupled with a cyclic dione to yield a tricyclic keto diene. This compound can be reduced to yield a tricyclic hydroxy compound useful as an intermediate in the total synthesis of steroidal compounds having known valuable pharmacological properties. Alternatively, it is possible to directly couple the Mannich base with the cyclic diketo compound followed by reduction and catalytic hydrogenation to yield the tricyclic hydroxy compound.

3,631,040

IMIDAZO[1,2-b]-AS-TRIAZINES

Bernard Loev, Broomall, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Feb. 7, 1969, Ser. No. 797,706
Int. Cl. C07d *57/34*
U.S. Cl. 260—249.5 7 Claims

1,5-dihydro-2,6-diphenylimidazo[1,2-b] - as - triazines are prepared either by reaction of a phenylglyoxal and aminoguanidine to give an aminophenyltriazine, further reaction with a phenacyl bromide, and reduction with borohydride; or directly by reaction of phenacyl bromide, aminoguanidine, and hydrogen bromide; and subsequent ring-closure in base. The products are antidepressants.

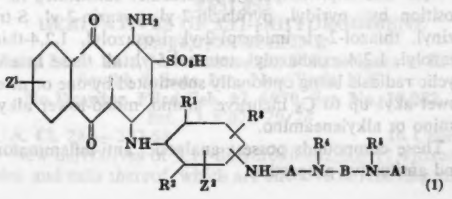
3,631,041

ANTHRAQUINONE DYESTUFFS

Robert Norman Heslop, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Jan. 3, 1969, Ser. No. 788,925
Claims priority, application Great Britain, Jan. 16, 1968, 2,406/68
Int. Cl. C07d *55/20, 51/42*
U.S. Cl. 260—249 6 Claims

The invention provides reactive water-soluble anthraquinone dyestuffs of the formula:



(1)

wherein

Z^1 represents H or SO_3H
R^1 represents CH_3 or C_2H_5
R^2 represents Cl, Br, CH_3 or C_2H_5
R^3 represents H, CH_3 or C_2H_5
Z^2 represents H, CH_3, C_2H_5 or SO_3H

A represents a s-triazine or pyrimidine nucleus carrying as celluluose-reactive substituent a chlorine or bromine atom or a sulphonic acid group.

R^4 and R^5 may be the same or different and each represents H, CH_3, C_2H_5 or C_2H_4OH,

B represents an aliphatic or cycloaliphatic radical having up to 6 carbon atoms, and

A^1 represents a radical containing a heterocyclic nucleus in which the nucleus carries at least one substituent capable of reacting with the hydroxyl groups in cellulose.

These new dyestuffs are notable for the following combination of properties, namely, a remarkably high fixation on the fibre whereby washing off treatments can be reduced considerably, a desirable bright reddish-blue shade and high light-fastness.

3,631,042

QUINAZOLINE COMPOUNDS

Michel Vincent, Bagneux, Georges Remond, Paris, and Jean-Claude Poignant, Wissous, France, assignors to Societe en nom collectif: "Science Union et Cie, Societe Francaise de Recherche Medicale," Suresnes, France

No Drawing. Filed Oct. 22, 1969, Ser. No. 868,641

Claims priority, application Great Britain, Oct. 31, 1968, 51,720/68

Int. Cl. C07d *51/48*

U.S. Cl. 260—251 **8 Claims**

1H-quinazolin-4-ones substituted in 1-position by alkenyl, haloalkenyl, cycloalkenyl, phenylalkenyl, alkynyl or cyclopropyl, and optionally substituted in 6- or 7-position by halogen, lower alkyl, lower alkyloxy, phenyl, trifluoromethyl or methylenedioxy.

These compounds possess analgesic, antitussive, anti-inflammatory and anti-rheumatic properties.

3,631,043

DI- AND TRIPHENYLPROPYL PIPERAZINE COMPOUNDS

Gilbert Regnier, Sceaux Village, Roger Canevari, La Hay-les-Roses Village, and Jean-Claude Le Douarec, Suresnes Village, France, assignors to Societe en nom collectif "Science Union et Cie, Societe Francaise de Recherche Medicale," Suresnes, France

No Drawing. Filed Mar. 8, 1968, Ser. No. 711,496

Claims priority, application Great Britain, Mar. 14, 1967, 11,843/67

The portion of the term of the patent subsequent to Mar. 25, 1986, has been disclaimed

Int. Cl. C07d *51/70*

U.S. Cl. 260—250 A **7 Claims**

1-(di- and triphenylpropyl piperazines substituted in 4-position by: pyridyl, pyridazin-2-yl, pyrazin-2-yl, S-triazinyl, thiazol-2-yl, imidazol-2-yl, isoxazolyl, 1,2,4-thiadiazolyl, 1,2,4-oxadiazolyl, tetrazol-5-yl; all these heterocyclic radicals being optionally substituted by one or more lower-akyl up to C_8 inclusive, amino, mono-lower alkylamino or alkyleneamino.

These compounds possess analgesic, anti-inflammatory and antitussive properties.

3,631,044

SUBSTITUTED PYRROLO[2,3-d]PYRIMIDINES AND RELATED COMPOUNDS

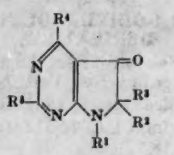
Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 4, 1969, Ser. No. 874,049

Int. Cl. C07d *57/14*

U.S. Cl. 260—256.4 F **7 Claims**

The disclosure is directed to substituted pyrrolo[2,3-d] pyrimidines having the structural formula



(I)

where R^1–R^5 are as defined below. The compounds have pharmacological activity as central nervous system depressants in that they decrease motor activity and decrease respiration in a host.

3,631,045

4,5-DIAMINO-7H-PYRROLO[2,3-*d*]PYRIMIDINE DERIVATIVES

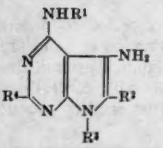
Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 4, 1969, Ser. No. 874,053

Int. Cl. C07d *57/14*

U.S. Cl. 260—256.5 R **6 Claims**

The disclosure is directed to derivatives of 4,5-diamino-7H-pyrrolo[2,3-*d*]pyrimidines having the structural formula:



where R^1–R^4 are as defined below, and to the 4,5,6-trisubstituted pyrimidines which are intermediates in their preparation. The compounds have central nervous system activity as depressants that is, they produce a calming effect in the host.

3,631,046

TETRACYCLIC QUINAZOLIN-ONES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed May 28, 1969, Ser. No. 835,289

Int. Cl. C07d *51/56, 57/16*

U.S. Cl. 260—256.4 F **12 Claims**

The compounds are tetracyclic quinazolin-ones of the class of polyhydro-pyrido[1′,2′:3,4]-imidazo[2,1-b] or polyhydro-pyrido[1(,2(:3,4]-pyrimido[2,1-b] quinazolin-11-ones which are pharmacologically active as central nervous system depressants and useful, for example, as sedatives. Preparation involves reaction of novel intermediates of the class polyhydro-3-organomercapto-imidazo[1,5-a]pyridine and polyhydro-1-organomercapto-pyrido[1,2-c] pyrimidine with N-carboxy anthranilic anhydride(isatoic anhydride), or its derivatives, or with anthranilic acid, or its derivatives. The novel intermediates are in turn produced from novel compounds of the class of polyhydro-imidazo-pyridine or polyhydro-pyrido-pyrimidine thiones, for example, by reaction with a haloalkyl.

3,631,047
SUBSTITUTED 3,3-DIPHENYLPIPERAZINES AND 3,3-DIPHENYLPIPERAZIN-2-ONES

Meier E. Freed and Scott J. Childress, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,367
Int. Cl. C07d *51/72*
U.S. Cl. 260—268 R 7 Claims

The disclosure is directed to substituted 3,3-diphenylpiperazines, substituted 3,3-diphenylpiperazin-2-ones and relates compounds. The compounds are useful as sympathomimetic agents as evidenced by their production of mydriasis in standard laboratory animals.

3,631,048
PIGMENTS OF THE PERYLENETETRAACETIC CARBOXYLIC ACID DIIMIDE SERIES

Georg Anton Klein, Bottmingen, Basel-Land, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed July 14, 1970, Ser. No. 54,858
Int. Cl. C07d *91/62*
U.S. Cl. 260—281 6 Claims

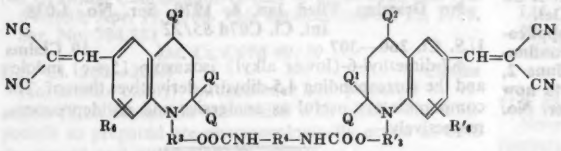
Perylenetetraacetic carboxylic acid diimides are prepared by condensing perylene - 3,4,9,10 - tetracarboxylic acid with 2-aminothiadiazoles. The new perylene derivatives are used as pigments.

3,631,049
BIS-TETRAHYDROQUINOLINE METHINE COMPOUNDS

James M. Straley and David J. Wallace, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Apr. 27, 1966, Ser. No. 545,546, now Patent No. 3,504,010, dated Mar. 31, 1970. Divided and this application Dec. 4, 1969, Ser. No. 882,287
Int. Cl. C07d *33/10*
U.S. Cl. 260—283 CN 3 Claims

Methine dye compounds having the general formula



wherein Q, Q^1 and Q^2 each is hydrogen or methyl; R_3 and R'_3 each is lower alkylene; R^4 is alkylene, methylenediphenylene, arylene or cyclohexylenedimethylene; and R_6 and R'_6 each is hydrogen, alkyl, alkoxy or halogen. The disclosed compounds are useful as dyes for hydrophobic textile materials such as polyester fibers on which the compounds exhibit improved resistance to sublimation.

3,631,050
HEXAHYDRO-9b-METHYLFURO[3,2-c] QUINOLINE COMPOUNDS

Edward F. Elslager and Donald F. Worth, Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,492
Int. Cl. C07d *99/04*
U.S. Cl. 260—287 R 5 Claims

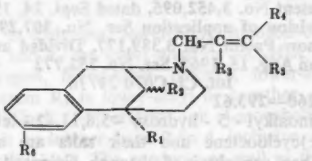
A series of 2,3,3a,4,5,9b-hexahydro-9b-methyl-4-phenylfuro[3,2-c]quinoline compounds variously substituted at the 8 position of the furoquinoline ring system and/or at the para position of the 4-phenyl group. The substituent at one of the indicated positions is hydroxy or acyloxy and at the other of the indicated positions is hydrogen, hydroxy, lower alkoxy, or acyloxy. The compounds have hypocholesteremic activity and can be produced by (a) reacting an N-benzylideneaniline compound with 5-methyl-2, 3-dihydrofuran in the presence of a Lewis acid, (b) converting a hydroxy group to a lower alkoxy group, (c) esterifying a hydroxy group, or (d) hydrolyzing an ester group.

3,631,051
PROCESS FOR PRODUCING 2-SUBSTITUTED 6,7-BENZOMORPHAN DERIVATIVES

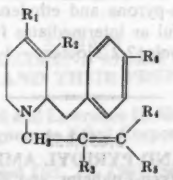
Toshio Atsumi, Kenji Kobayashi, and Yoshiaki Takebayashi, Takarazuka, and Hisao Yamamoto, Nishinomiya, Japan, assignors to Sumitomo Chemical Co., Ltd.

No Drawing. Filed May 28, 1969, Ser. No. 828,738
Claims priority, application Japan, May 30, 1968, 43/37,308; May 31, 1968, 43/37,439, 43/37,440; Sept. 16, 1968, 43/67,081; Oct. 2, 1968, 43/72,079, 43/72,080, 43/72,081, 43/72,082
Int. Cl. C07d *39/00*
U.S. Cl. 260—293.54 8 Claims

A process for preparing 2-substituted 6,7-benzomorphan derivatives, and salts thereof, represented by the general formula,



wherein R_1 and R_2 are respectively C_1–C_3 alkyl groups; R_3 R_4 and R_5 are respectively hydrogen atoms or C_1–C_3 alkyl groups; R_6 is a hydrogen atom, a hydroxyl group, a C_1–C_3 alkyl group or a C_1–C_3 alkoxy group, which process comprises contacting with a mixture of phosphoric acid and phosphorus pentoxide, the ratio of phosphorus pentoxide to phosphoric acid being 0.2 to 2.0 on the base of weight, a 1-substituted 1,2,5,6-tetrahydropyridine derivative, or a salt thereof, represented by the general formula,



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are as defined above, the cyclisation reaction being conducted in an anhydrous state. The benzomorphan derivatives are useful as analgesics.

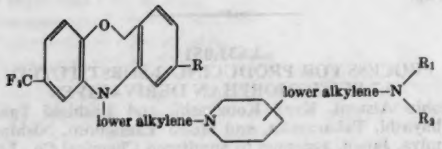
3,631,052
DERIVATIVES OF 5,11-DIHYDRODIBENZ [b,e][1,4]OXAZEPINE

Harry Louis Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Feb. 12, 1970, Ser. No. 10,982
Int. Cl. C07d *29/28*
U.S. Cl. 260—293.58 10 Claims

New derivatives of 5,11-dihydrodibenz[b,e][1,4]oxazepine and salts thereof, which are effective in relieving anx-

iety without other central depressant effects, have the structural formula



their salts and quartenary ammonium compounds, as well as their optically active isomers or diastereomers wherein R^1 to R^4 represent hydrogen, halogen, lower alkyl, aralkyl, phenyl, hydroxyl, lower alkoxy, nitro or lower carboalkoxy, R^5 and R^6 are hydrogen or methyl, R^7 and R^8 are hydrogen, halogen or lower alkoxy, X is a heterocyclic ring system, mono- or condensed bicyclic, with 1–4 hetero atoms, in which the individual rings have 5 to 6 members and can also contain 1 or more carbonyl groups, Y is —CO— or —CH(OH)—. These compounds have pharmacological activity in that they increase the coronary blood flow by simultaneously causing dilation of the coronaries and an increase in contraction strength.

3,631,053

5-AMINOALKYL-5-HYDROXY-5,6,11,12-TETRAHYDRODIBENZO[a,e]CYCLOOCTENE

Kurt Adank, Muttenz, and Daniel A. Prins, Oberwil, Basel-Land, Switzerland, assignors to Geigy Chemical Corporation, Greenburgh, N.Y.

No Drawing. Application Sept. 22, 1967, Ser. No. 681,944, now Patent No. 3,452,095, dated Sept. 24, 1969, which is a division of application Ser. No. 307,290, Sept. 9, 1963, now Patent No. 3,389,177. Divided and this application Aug. 15, 1968, Ser. No. 752,772

Int. Cl. C07d *29/16*

U.S. Cl. 260—293.62 3 Claims

5 - aminoalkyl - 5 - hydroxy - 5,6,11,12 - tetrahydrodibenzo[a,e]cyclooctene and their salts are spasmolytic agents. They are obtained through Grignard conditions from 11,12-dihydrodibenzo[a,e]cycloocten-5(6H)-one. A typical embodiment is 5-piperidinopropyl - 5 - hydroxy-5,6,11,12-tetrahydrodibenzo[a,e]cyclooctene.

3,631,054

4-AROMATIC BICYCLO[2.2.2.]OCT-2-ENE-1-CARBOXYLIC ACIDS AND THEIR ESTERS

James C. Kauer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 650,595, July 3, 1967, which is a continuation-in-part of applications Ser. No. 460,812, June 2, 1965, and Ser. No. 377,132, June 22, 1964, both now abandoned. This application Jan. 22, 1970, Ser. No. 5,132

Int. Cl. C07d *31/34*

U.S. Cl. 260—295 F 15 Claims

4-aromatic bicyclo[2.2.2]oct-2-ene-2-carboxylic acids and their esters which are prepared by the reaction of a 3,6-disubstituted α-pyrone and ethylene at elevated temperatures are useful as intermediates for the preparation of 4-aromatic bicyclo[2.2.2]octane - 1 - amines useful as anti-depressant.

3,631,055

THIAZOLYL AND PYRIDYL AMINOALCOHOLS

Klaus Posselt, Bergen-Enkheim, and Kurt Thiele, Frankfurt am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

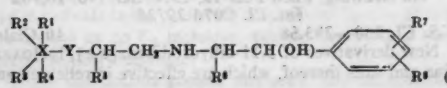
No Drawing. Continuation-in-part of application Ser. No. 693,138, Dec. 26, 1967. This application Mar. 10, 1970, Ser. No. 18,279

The portion of the term of the patent subsequent to May 26, 1987, has been disclaimed

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 R 4 Claims

Compounds of the formula



(I)

3,631,056

BASIC ESTERS OF α-CARBOXY ARYL PENICILLINS

Kenneth Butler, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 695,889, Jan. 5, 1968. This application June 4, 1969, Ser. No. 830,517

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 13 Claims

Arylchloro (and bromo) carbonyl ketenes, arylcarboxy ketene basic esters derived therefrom, methods for their preparation and the use of the esters as acylating agents for the production of basic esters of α-carboxy aryl acetyl derivatives of 6-aminopenicillanic acid and, by hydrolysis, the corresponding acid derivatives, are described.

3,631,057

NOVEL 4,7 - DIMETHYL-6-(LOWER ALKYL) ISOXAZOLO[5,4-e]INDOLES AND METHODS OF PREPARING SAME

William Alan Remers, Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 6, 1970, Ser. No. 1,038

Int. Cl. C07d *85/22*

U.S. Cl. 260—307 10 Claims

4,7-dimethyl-6-(lower alkyl) isoxazolo [5,4-e] indoles and the corresponding 4,5-dihydro derivatives thereof. The compounds are useful as analgesics and antidepressants, respectively.

3,631,058

PROCESS FOR THE PRODUCTION OF CHLORINATED N-METHYL IMIDAZOLES

Gunther Beck and Hans Holtschmidt, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 11, 1968, Ser. No. 743,973

Claims priority, application Germany, Aug. 19, 1967, F 53,287

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 11 Claims

Chlorinated N-methyl imidazoles are obtained by chlorinating dimethylamino acetonitrile in an inert solvent at temperatures of up to 150° C. by raising the chlorination temperature by about 10 to 20° C. per hour.

3,631,059

PROCESS FOR THE EXTRACTION AND PURIFICATION OF PILOCARPINE

John T. Goorley, 2313 Jasmine St., and Robert L. Holt, 913 Middleton St., both of Monroe, La. 71201

No Drawing. Filed Sept. 11, 1967, Ser. No. 666,950

Int. Cl. C07k *49/36*

U.S. Cl. 260—309 7 Claims

This invention relates to a process for the extraction and purification of alkaloids and nitrogenous compounds

from plant and animal tissue which comprises the steps of extracting plant and animal tissues having a low fat content with a dilute aqueous solution of an acid selected from the group consisting of strong mineral acids and strong organic acids having a concentration of between 0.1% to 10% by weight, neutralizing the aqueous acidic extract to a pH of between 5 to 13, contacting the neutralized aqueous extract with activated carbon, separating the carbon absorbate, extracting the alkaloids and nitrogenous compounds from said carbon absorbate with an extraction fluid selected from the group consisting of (1) a dilute aqueous solution of an acid selected from the group consisting of strong mineral acids and strong organic acids having a concentration of between 0.1% and 10% by weight and containing from 0% to 10% weight of an alkanol having from 1 to 6 carbon atoms and (2) an anhydrous organic solvent, and recovering said alkaloids and nitrogenous compounds in purified form.

3,631,060

PROCESS FOR TREATING 4(5)-NITROIMIDAZOLES

William A. Sklarz, Clark, and Albert D. Epstein, Edison, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,414
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 **8 Claims**

The purity of 4(5)-nitroimidazoles is improved by maintaining dilute, spent nitration reaction mixture at an elevated temperature for a period of time sufficient to destroy undesirable reaction by-products.

3,631,061

ACYLAMIDO PHENYL IMIDAZOLONES

Stanley C. Bell, Penn Valley, and Carl Gochman, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 543,555, Apr. 19, 1966. This application Feb. 12, 1968, Ser. No. 704,581
Int. Cl. C07d *49/30*
U.S. Cl. 260—309.7 **4 Claims**

Acylamido phenyl imidazolones are prepared by reaction of an acylamido acetanilide with alkali. The compounds so prepared are pharmacologically active as CNS depressant and anticonvulsant agents.

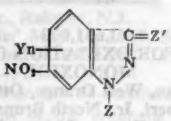
3,631,062

N'-SUBSTITUTED-6-NITROINDAZOLES

Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.

No Drawing. Continuation-in-part of application Ser. No. 589,235, Oct. 25, 1966. This application Mar. 29, 1968, Ser. No. 717,442
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 C **4 Claims**

N'-sbustituted-6-nitroindazoles that have the structural formula



wherein Z represents —S—$(CHX)_m$—CH_nX_{3-n} or —SO_2R; Z' represents hydrogen or halogen; Y represents lower alkyl, halogen, or nitro; X represents halogen; R represents phenyl, tolyl, or —CH_nX_{3-n}; *m* is an integer in the range of zero to one; and *n* is an integer in the range of zero to two can be used to control the growth of various plant and animal pests. Among the most active of these compounds is N'-trichloromethylmercapto-6-nitroindazole.

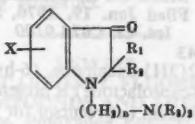
3,631,063

1-AMINOALKYL-2,2-DISUBSTITUTED INDOLIN-3-ONES AND A PROCESS FOR THE PRODUCTION THEREFOR

Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed May 28, 1969, Ser. No. 828,741
Int. Cl. C07d *27/40*
U.S. Cl. 260—326.11 **10 Claims**

Compounds of the formula:



wherein X is hydrogen, lower-alkyl, halogen or —CF_3; wherein R_1 and R_2 are lower-alkyl or —C_6H_4X' in which X' is hydrogen, lower-alkyl, halogen, lower-alkoxy or —CF_3; wherein R_3 is lower-alkyl or together —$N(R_3)_2$ is 1-pyrrolidinyl, 1-piperidinyl or 4-morpholinyl; and wherein *n* is an integer from 2 to 4, inclusive, are made from 3H-indol-3-ols. The products as well as their pharmacologically acceptable acid addition salts have sedative activity and can be administered to tranquilize mammals.

3,631,064

THIOPHENOCHROMENE COMPOUNDS AND PROCESS FOR PRODUCING THEM

Shiro Kimura, Sadao Ishige, and Teruo Kobayashi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Sept. 16, 1969, Ser. No. 858,526
Claims priority, application Japan, Sept. 16, 1968, 43/66,820
Int. Cl. C07d *63/22*
U.S. Cl. 260—330.5 **6 Claims**

Novel thiophenochromene compounds, useful as color formers for use in pressure-sensitive copy papers, and a process for preparing these compounds are disclosed.

3,631,065

ALUMINACYCLOALKENE MOIETY CONTAINING COMPOUNDS AND THEIR PREPARATION AND USES

Gottfried J. Brendel and Lawrence H. Shepherd, Jr., Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Oct. 29, 1968, Ser. No. 771,651
Int. Cl. C07f *5/06*
U.S. Cl. 260—340.6 **32 Claims**

Nonionic compounds in which an aluminum atom is part of an olefinically unsaturated ring system are prepared by causing interaction among aluminum, a conjugated diene and a hydrocarbon aluminum hydride in the presence of a suitable Lewis base such as 1,4-dioxane or N-methyl pyrrolidine. The resulting cyclic organo-aluminum compound is useful in the synthesis of olefins and branched chain alkenols. Thus by subjecting the cyclic organo-aluminum compound to hydrolysis, one or more olefins may be produced. To prepare branched chain alkenols, the cyclic organo-aluminum compound is reacted with a cleavable cycloparaffinic monoether having a 3, 4 or 5 membered ring. Thereupon the reaction mixture is

subjected to hydrolysis. The following novel compounds were prepared by this procedure:

1-chloromethyl-3,4-dimethyl-4-penten-1-ol
1-chloromethyl-3,3-dimethyl-4-penten-1-ol
2,2-bis(chloromethyl)-4,5-dimethyl-5-hexen-1-ol
2,2-bis(chloromethyl)-4,4-dimethyl-5-hexen-1ol
1,5,5-trimethyl-6-hepten-1-ol
1,5,6-trimethyl-6-hepten-1-ol
4,5,6-trimethyl-6-hepten-1-ol
2,2,3-trimethyl-5,5-bis(chloromethyl)tetrahydropyran.

3,631,066
4,5-DIHYDRO-2(3H)-OXEPINONE
Chin-Chiun Chu, South Plainfield, N.J., assignor to Mobil Oil Corporation
No Drawing. Filed Jan. 19, 1970, Ser. No. 4,023
Int. Cl. C07d *9/00*
U.S. Cl. 260—343 **1 Claim**

4,5 - dihydro-2(3H)-oxepinone, (6-hydroxy-5-hexenoic acid *e*-lactone, Δ^6-caprolactone) is presented. It can be converted to *e*-caprolactam (a precursor for Nylon-6), 2,3,4,5-tetrahydro-2(1H)-azepinone(6-amino-5-hexenoic acid lactam) which may be prepared by reaction of the lactone with ammonia.

3,631,067
PREPARATION OF COUMARIN
Robert J. Nankee, Midland, and Charles F. Fosberry, Sanford, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 5, 1970, Ser. No. 844
Int. Cl. C07d *7/28*
U.S. Cl. 260—343.2 R **7 Claims**

In the process for preparing coumarin by reacting salicylaldehyde with an alkali metal acetate and acetic anhydride, separation of the product is improved without detrimentally affecting the yield by maintaining the molar concentration of alkali metal acetate at or below the concentration of the total salicylaldehyde employed in the reaction and then separating the coumarin from the reaction mixture by distillation.

3,631,068
PROCESS FOR CONVERTING A MIXED TOCOPHEROL CONCENTRATE TO ESSENTIALLY ALL ALPHA-TOCOPHEROL
Donald R. Nelan, Rush, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Dec. 15, 1969, Ser. No. 885,347
Int. Cl. C07d *7/22*
U.S. Cl. 260—345.5 **5 Claims**

A tocopherol concentrate containing non alpha-tocopherols, such as one containing alpha, beta, gamma, and delta-tocopherols, is converted to essentially all alpha-tocopherol by reacting with the mixed concentrate an aldehyde such as formaldehyde and a hydrogen halide such as hydrogen chloride in the presence of metallic tin as a reducing agent.

3,631,069
SUBSTITUTED PHENETHYL ALCOHOLS AND THEIR ESTERS
Ulrich Renner, Riehen, Switzerland, Niels Clauson-Kaas, Farum, Denmark, and Franz Ostermayer, Riehen, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed Apr. 22, 1969, Ser. No. 818,409
Int. Cl. C07d *27/24*
U.S. Cl. 260—326.3 **10 Claims**

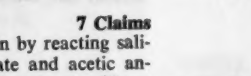
Compounds of the class of p-(1-pyrryl)-phenethyl alcohols and alkanoyl esters thereof have analgesic and anti-inflammatory properties; they are active ingredients of pharmaceutical compositions and are useful for alleviating pain and treating inflammatory diseases; illustrative embodiments are p-(1-pyrryl)-phenethyl alcohol and the propionic acid ester thereof.

3,631,070
TETRAHYDROFURYL ETHERS OF STEROIDS AND PREPARATION THEREOF
Alexander Mebane, New York, N.Y., assignor to Ortho Pharmaceutical Corporation
No Drawing. Continuation-in-part of application Ser. No. 530,412, Feb. 28, 1966. This application Mar. 9, 1967, Ser. No. 622,870
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 R **7 Claims**

The present invention relates to novel steroidal tetrahydrofuryl ethers and the process for their preparation. More particularly, the present invention relates to 3-(tetrahydro-2′-furyl) ethers having antilittering activity and 17-(tetra-hydro-2′-furyl) ethers of steroids and the process for their preparation.

3,631,071
S-AROYL-, S-THIOAROYL-, AND S-[(N-ARYL) HYDROCARBYLIMIDOYL]HYDROSULFAMINES
Maynard S. Raasch, Fairfax, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Sept. 15, 1969, Ser. No. 858,101
Int. Cl. C07c *153/01*; C07d *5/14*
U.S. Cl. 260—347.2 **19 Claims**

Novel substituted hydrosulfamines useful as rubber curing agents, of the formula:



where *n* is 1, 2, or 3; X is O, S, or NR′; when X is O or S, R is substituted or unsubstituted aryl; when X is NR′, R is substituted or unsubstituted alkyl, aralkyl or aryl; and R′ is substituted or unsubstituted aryl. The above compounds are prepared by the reaction of alkali metal or alkaline earth metal hydroxylamine-O-sulfonates with arenecarbothioate, arenecarbodithioate and (N-aryl)hydrocarbylcarboximidothioate alkali metal salts.

3,631,072
EPOXIDATION OF DICYCLOPENTADIENE
Ming N. Sheng, Cherry Hill, and Rudolph Rosenthal, Broomall, Pa., assignors to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Mar. 9, 1970, Ser. No. 17,941
Int. Cl. C07d *1/08*
U.S. Cl. 260—348.5 L **3 Claims**

Dicyclopentadiene is epoxidized to the diepoxide exclusively when employing tertiary butyl hydroperoxide as the oxidizing agent in the presence of a molybdenum-containing catalyst by removing the tertiary butyl alcohol from the reaction system as it is formed. This permits the use of higher reaction temperatures and the formation of the diepoxide as the exclusive product.

3,631,073
PROCESS FOR OXIDATION OF CARBON MONOXIDE
Johann G. E. Cohn, West Orange, Otto J. Adlhart, Newark, Walter Egbert, Jr., North Brunswick, and Heinrich K. Straschil, East Orange, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Newark, N.J.
Filed Apr. 4, 1969, Ser. No. 813,432
Int. Cl. C01b *2/02*
U.S. Cl. 252—373 **1 Claim**

An improved process for the selective oxidation of carbon monoxide contained in feed gases from a steam

reformer-converter wherein the feed gases in admixture with oxygen are contacted with a platinum group metal catalyst and the activity of the catalyst for the selective oxidation reaction is maintained by periodically treating deactivated catalyst with the selected oxidation reaction effluent gases containing less than 50 p.p.m. carbon monoxide at a temperature of 75° to 200° C.

3,631,074

PROCESS FOR THE PRODUCTION OF SUBSTITUTED ANTHRAQUINONES

Hans-Samuel Bien, Burscheid, and Walter Hohmann and Heinrich Vollmann, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 710,640, Mar. 5, 1968, which is a continuation-in-part of abandoned application Ser. No. 390,244, Aug. 17, 1964. This application Nov. 24, 1969, Ser. No. 879,630

Int. Cl. C01b *1/10*

U.S. Cl. 260—383 **8 Claims**

A process for the production of an α-chlorinated anthraquinone having hydroxy substituents in the 1,4-positions which comprises chlorinating at a temperature of 50–120° C. a boric acid complex of a 1,4-dihydroxy-anthraquinone or a boric acid complex of a 1,4-dihydroxy-anthraquinone having 1 to 2 chlorine atoms in the 2-, 3-, 5-, 6-, 7- or 8-positions but with at least one of the 5- and 8-positions unsubstituted, in a solvent selected from the group consisting of sulphuric acid containing SO_3 and chlorosulphonic acid in the presence of iodine, sulphur chloride or iron-III-salts as halogenating catalyst and splitting off boric acid by hydrolysis.

3,631,075

3-OXYGENATED 21β - (SUBSTITUTED PHOSPHINYL)PREGNA-4/5, - 17(20),20 - TRIENES AND 19-NOR DERIVATIVES THEREOF

Walter R. Benn, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 666,481, Sept. 8, 1967. This application Dec. 2, 1969, Ser. No. 881,588

Int. Cl. C07c *169/32, 169/34*

U.S. Cl. 260—397.3 **11 Claims**

The above-entitled novel chemical compounds are obtained by reaction of an appropriate 17α-ethynyl-17β-hydroxy steroid with a substituted chlorophosphine or chlorophosphite and exhibit valuable pharmacological properties, e.g. anti-bacterial, anti-protozoal, anti-fungal and anti-inflammatory.

3,631,076

PROCESS FOR PREPARING 16-UNSATURATED STEROIDS

Ludwig Salce, Clark, George G. Hazen, Westfield, and Erwin F. Schoenewaldt, Watchung, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed May 14, 1969, Ser. No. 824,658

Int. Cl. C07c *167/14*

U.S. Cl. 260—397.45 **9 Claims**

A process for preparing 16-unsaturated steroids from 17α-hydroxy steroids of the pregnane series by heating the 17α-acyloxy derivative with a metal salt of a lower alkanoic or aromatic acid in a polar organic solvent. A novel compound, pregna-1,4,16-triene-3,20-dion-11β,21-diol diacetate is disclosed. The adrenocortical steroids produced have anti-inflammatory and anti-allergenic properties.

3,631,077

NEW 16α-ALKYL-STEROIDS

Filippus Johannes Zeelen and Albertus Joannes van den Broek, Oss, and Martinus Johannes van den Heuvel, Vught, Netherlands, assignors to Organon Inc., West Orange, N.J.

No Drawing. Filed Jan. 22, 1969, Ser. No. 793,180

Claims priority, application Netherlands, Feb. 1, 1968, 6801449

Int. Cl. C07c *169/32, 169/34*

U.S. Cl. 260—397.3 **5 Claims**

The present invention relates to the preparation of a group of novel Δ^4-3-keto-16α-alkyl-20-oxygenated steroids of the pregnane and 19-nor-pregnane series substituted in 21-position with a hydroxyl, acyloxy or fluoro group, and possibly unsaturated in 6–7 position, which compounds have strong progestative, ovulation-inhibiting and pregnancy-maintaining properties.

3,631,078

9,9-BIS-OMEGACARBONYL FLUORINE SULFONIC ACID COMPOUNDS AND THEIR SALTS

John Ewart Lodge, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Original application Aug. 31, 1967, Ser. No. 664,640, now Patent No. 3,560,448, dated Feb. 2, 1971. Divided and this application July 10, 1969, Ser. No. 851,532

Claims priority, application Great Britain, Sept. 13, 1966, 40,815/66

Int. Cl. C07c *143/52*

U.S. Cl. 260—507 R **7 Claims**

9,9-bis-omegacarbamyl fluorene mono- and di-sulfonic acids and their alkali metal and alkaline earth metal salts.

3,631,079

PROCESS FOR THE MANUFACTURE OF CARBOXYLIC ACIDS AND UNSATURATED ESTERS OF CARBOXYLIC ACIDS

Kurt Sennewald and Wilhelm Vogt, Knapsack, near Cologne, Heinz Erpenbach, Surth, near Cologne, and Hermann Glaser, Knapsack, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

No Drawing. Filed Mar. 22, 1968, Ser. No. 715,190

Claims priority, application Germany, Apr. 5, 1967, K 61,900

Int. Cl. C07c *67/04;* C11c *3/00*

U.S. Cl. 260—410 **5 Claims**

Production of carboxylic acids (defined as carboxylic acids I) and of unsaturated esters of carboxylic acids (defined as carboxylic acids II), whereby the carboxylic acid II may be identical with the carboxylic acid I, by reacting an olefinic compound in the presence of an aldehyde, which in structure and number of carbon atoms corresponds to the carboxylic acid I, and in the presence of the carboxylic acid II, each of the said olefinic compound, the said aldehyde and the said carboxylic acids containing 2 to 20 carbon atoms, with molecular oxygen or air in the gas phase, at elevated temperature and in contact with a palladium-containing carrier catalyst.

3,631,080

QUATERNARY ALKYLATED ACIDS AND ESTERS USEFUL FOR THE CONTROL OF INSECTS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Continuation-in-part of application Ser. No. 860,086, Sept. 22, 1969. This application Nov. 6, 1969, Ser. No. 874,678

Int. Cl. A01n *9/24;* C07c *69/52, 103/58*

U.S. Cl. 260—410.9 R **7 Claims**

Methods of employing and compositions comprising quaternary alkylated aliphatic acids, esters and amides for the control of insects.

3,631,081

RARE EARTH PERFLUOROTERTIARYBUTOXIDES CONTAINING COORDINATED AMMONIA

Dale K. Huggins, Convent Station, and William B. Fox, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,133
Int. Cl. C07f 5/00
U.S. Cl. 260—429 R 10 Claims

Rare earth perfluorotertiarybutoxides containing coordinated ammonia and having the formula

$$(NH_3)_3M[OC(CF_3)_3]_3$$

wherein M represents an ion of a rare earth metal, are prepared by reacting prefluorotertiarybutanol with an ionizable rare earth salt and ammonia in the presence of an inert solvent. These compounds are novel and more volatile than any rare earth compounds previously known. Because of their volatility, the compounds are useful in such applications as the separation of individual rare earths by fractional sublimation.

3,631,082

NOVEL PROCESS FOR PREPARING SULFUR-CONTAINING ORGANOTIN COMPOUNDS

Kenichi Kino, Amagasaki-shi, Takashi Matsuzaki, Osaka-fu, and Hiroshi Ichikawa, Amagasaki-shi, Japan, assignors to Nitto Kasei Co., Ltd., Osaka, Japan

No Drawing. Filed Sept. 15, 1969, Ser. No. 858,158
Claims priority, application Japan, Sept. 13, 1969, 44/65,991
Int. Cl. C07f 7/22
U.S. Cl. 260—429.7 2 Claims

Sulfur-containing organotin compounds of the formula

$$R_2Sn[S(CH_2)_nCOOR']_2$$

wherein R is a 1–18 C hydrocarbon radical, R' is a 1–18 C hydrocarbon radical, or an alkoxyalkyl radical, and *n* is 1 or 2 may be prepared by the reaction of a di-substituted organotin oxide with a mercapto acid ester in the presence of a dehydrating agent.

3,631,083

MAGNESIUM-ALUMINUM COMPLEXES OF POLYHYDROXY COMPOUNDS AND THEIR PREPARATION

Ludwig A. Hartmann, Wilmington, Del., assignor to Atlas Chemical Industries Inc., Wilmington, Del.

No Drawing. Filed Apr. 24, 1970, Ser. No. 31,750
Int. Cl. C07f 5/06
U.S. Cl. 260—448 AD 20 Claims

Magnesium-aluminum complexes of polyhydroxy compounds are prepared by reacting a magnesium alkoxide and an aluminum alkoxide with a polyhydroxy compound such as sorbitol in the presence of water.

3,631,084

SILYL ESTERS OF TEREPHTHALIC ACID AND ISOPHTHALIC ACID

Thomas V. Liston, Kentfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Original application Nov. 22, 1967, Ser. No. 684,922, now Patent No. 3,538,000, dated Nov. 3, 1970. Divided and this application Feb. 13, 1970, Ser. No. 14,895
Int. Cl. C07f 7/08
U.S. Cl. 260—448.2 B 4 Claims

Silyl esters of terephthalic acid and isophthalic acid find use as corrosion inhibitors in combination with slightly basic or neutral ashless lubricating oil detergents.

3,631,085

PREPARATION OF METHALLYLSILANES

Robert H. Krahnke, Keith W. Michael, and Edwin P. Plueddemann, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Mar. 23, 1970, Ser. No. 22,069
Int. Cl. C07f 7/08
U.S. Cl. 260—448.2 E 8 Claims

The preparation of methallylsilanes which involves contacting (in an open system) a hydrogen-substituted organosilicon compound with diisobutylene, at a temperature of from 400° C. to 600° C. The present method is less difficult (and thus less expensive) than prior art methods and the recovered methallylsilanes are useful in the production of certain synthetic resins.

3,631,086

PRODUCTION OF ORGANO-SILICON COMPOUNDS

Klaus Seyfried, Cologne, Hans-Horst Steinbach, Schildgen, and Walter Noll, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 9, 1969, Ser. No. 831,704
Claims priority, application Germany, June 29, 1968, P 17 68 785.3
Int. Cl. C07f 7/02, 7/08, 7/18
U.S. Cl. 260—448.2 E 5 Claims

In a process for the production of an organo-silicon compound by the addition of a hydrogen-silane or -siloxane to an olefinically-unsaturated organic compound in the presence of a catalyst, the catalyst according to the invention is trimethyl-dipyridine-platinum-iodide of the formula

$$(CH_3)_3Pt(C_6H_5N)_2I$$

3,631,087

UNIFORM GRAFTING OF ORGANOPOLYSILOXANES

Richard Newton Lewis and Patrick James Adams, Tecumseh, Mich., assignors to Stauffer-Wacker Silicone Corporation, Adrian, Mich.

No Drawing. Filed Sept. 29, 1969, Ser. No. 862,052
Int. Cl. C08g 47/10; C07f 7/08
U.S. Cl. 260—448.2 E 6 Claims

An improved process for grafting organopolysiloxanes which comprises the gradual addition of unsaturated organic monomers to organopolysiloxanes in the presence of free-radical initiators. By this technique, homogeneous unniformly grafted products are obtained. Furthermore, it has been found possible to graft polar monomers which have been difficult or impossible to graft onto organopolysiloxanes heretofore.

3,631,088

ORGANOPHOSPHATOSILOXANES

Guenther Fritz Lengnick, Manitou Beach, Mich., assignor to Stauffer-Wacker Silicone Corporation, Adrian, Mich.

No Drawing. Continuation-in-part of application Ser. No. 782,778, Aug. 22, 1968, which is a division of application Ser. No. 652,672, July 12, 1967, now Patent No. 3,441,537. This application Nov. 14, 1969, Ser. No. 877,038
Int. Cl. C07f 7/02, 7/04; C08f 11/04
U.S. Cl. 260—448.2 N 5 Claims

The invention relates to curable one-component organophosphatosiloxanes and to the preparation of these room temperature curing systems by reacting organophosphatosilanes with hydroxyl terminated organopolysiloxanes. These organophosphatosiloxanes find utility as caulking compositions.

3,631,089
2-ACETYL OR AROYL XANTHIC ACID PHENYL ESTERS

Earl Reeder, Nutley, and Leo Henryk Sternbach, Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Division of application Ser. No. 684,963, Nov. 22, 1967, which is a division of application Ser. No. 417,855, Dec. 14, 1964, now Patent No. 3,362,962, which in turn is a continuation-in-part of application Ser. No. 339,910, Jan. 24, 1964. This application Feb. 3, 1970, Ser. No. 8,396

Int. Cl. C07c *154/00*

U.S. Cl. 260—455 B 10 Claims

2-acetyl or aroyl xanthic acid phenyl esters (A). (A) is prepared by reacting corresponding 2-aminophenyl ketone with nitrous acid; treating resulting product with salt of fluoroboric acid to obtain corresponding diazonium compound. Diazonium compound is converted to (A) with alkali or alkaline earth xanthate. (A) is convertible into 1,4-benzothiazepines, useful as muscle relaxants and anticonvulsants.

3,631,090
ETHER DINITRILES

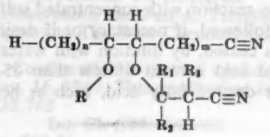
Robert C. Kuder, Excelsior, Minn., and Marwan R. Kamal, Dhahran, Saudi Arabia, assignors to General Mills, Inc.

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,431

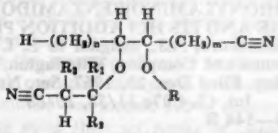
Int. Cl. C07c *121/20, 121/54*

U.S. Cl. 260—465 F 9 Claims

Ether dinitriles of the formulae



and



where n is 4 to 19, m is 0 to 15, the sum of n and m is 13 to 19, R_1, R_2 and R_3 are hydrogen or short chain alkyl groups of 1 to 4 carbon atoms and R is a monovalent organic radical. Diamines and diisocyanates derived therefrom with the latter being useful for preparing polymers.

3,631,091
N-ACYL-1,2-DICARBONYL-PHENYL-HYDRAZONES

Karl Heinz Buchel and Wilfried Draber, Wuppertal-Elberfeld, Ingeborg Hammann, Cologne, and Gunter Unterstenhofer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 2, 1969, Ser. No. 838,632

Claims priority, application Germany, July 5, 1968, P 17 68 834.5

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 D 10 Claims

N-acyl-1,2-dicarbonyl-phenyl-hydrazones, i.e. (α-cyano-α-alkanoyl and carboalkoxy)-carbonyl-N-(alkanoyl, chloroalkanoyl, alkenoyl and benzoyl)-[(mono, and same and mixed di and tri, -chloro and -trifluoromethyl)-phenyl]-hydrazones, which possess arthropodicidal, especially acaricidal and insecticidal, properties.

3,631,092
PROCESS FOR THE PRODUCTION OF 1,3-CYCLOHEXYLENE DIISOCYANATES

Peter T. Kan, Livonia, and Moses Cenker, Trenton, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Feb. 5, 1969, Ser. No. 796,933

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 PH 12 Claims

High yields of 1,3-cyclohexylene diisocyanates are prepared by contacting 1,3-cyclohexanediamines with phosgene in the presence of hydrogen chloride. The diisocyanates when reacted with polyester or polyether polyols provide urethane compositions that are especially suitable for use as coatings, sealants, and elastomers.

3,631,093
8[9→10]-ABEO-STEROIDS

Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Feb. 20, 1970, Ser. No. 13,206

Int. Cl. C07c *49/44, 69/14*

U.S. Cl. 260—488 B 5 Claims

8[9→10]-abeo-steroids and their 3-enolacylates, active as anti-androgens.

3,631,094
PROCESS FOR THE PRODUCTION OF AROMATIC POLYCARBOXYLATES

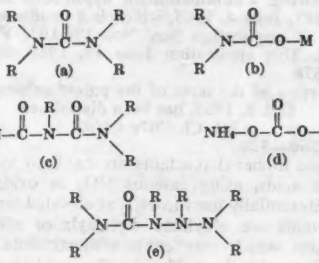
John E. Mahan and Donald G. Kuper, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Nov. 20, 1969, Ser. No. 878,529

Int. Cl. C07c *51/00, 51/52*

U.S. Cl. 260—515 P 9 Claims

Improved catalytic disproportionation of aromatic carboxylates to aromatic polycarboxylates containing at least one additional carboxyl group is achieved by carrying out the catalytic disproportionation process in the presence of a conventional disproportionation catalyst and at least one adjuvant compound of the group having a structural formula of



wherein R is hydrogen or an alkyl radical having from 1 to 4 carbon atoms, and M is NH_4, Li, Na, K, Rb or Cs.

3,631,095
PROCESS FOR THE PRODUCTION OF AROMATIC POLYCARBOXYLATES

Donald G. Kuper, Bartlesville, Okla., assignor to Phillips Petroleum Company

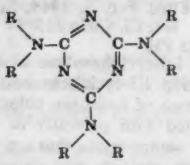
No Drawing. Filed Nov. 20, 1969, Ser. No. 878,534

Int. Cl. C07c *51/00, 51/52*

U.S. Cl. 260—515 P 6 Claims

Improved catalytic disproportionation of aromatic carboxylates to aromatic polycarboxylates containing at least one additional carboxyl group is achieved by carrying out

the catalytic disproportionation process in the presence of a conventional disproportionation catalyst and a melamine adjuvant of the formula



wherein R is hydrogen or an alkyl radical having from 1 to 4 carbon atoms therein.

3,631,096

PROCESS FOR THE PRODUCTION OF AROMATIC POLYCARBOXYLATES

Donald G. Kuper, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Nov. 20, 1969, Ser. No. 878,539
Int. Cl. C07c *51/00, 15/52*
U.S. Cl. 260—515 P 7 Claims

Increase in yield of aromatic polycarboxylic acid salts is achieved by carrying out the transformation process for the formation of same in an inert atmosphere and in the presence of a transformation catalyst having present therewith as an adjuvant an ammonium salt of an aromatic acid.

3,631,097

OXIDATION OF ALKYLATED DIPHENYL COMPOUNDS

Ludwig J. Christmann, Bronxville, N.Y.; Louise Christmann, executrix of said Ludwig J. Christmann, deceased, and Edward Sherrill Roberts, Ridgewood, N.Y.; said Roberts assignor to Carbogen Corporation, Bronxville, and Wilmot & Cassidy, Inc., Brooklyn, N.Y.

No Drawing. Continuation of application Ser. No. 461,497, June 4, 1965, which is a continuation-in-part of application Ser. No. 176,101, Feb. 27, 1962. This application June 19, 1968, Ser. No. 750,670
The portion of the term of the patent subsequent to Oct. 8, 1985, has been disclaimed
Int. Cl. C07c *63/02*
U.S. Cl. 260—520 8 Claims

Alkylated diphenyl reactants are oxidized to diphenylcarboxylic acids, using gaseous NO_2 as oxidant and a solvent substantially inert to NO_2 at elevated temperature. The reactants are alkylated diphenyls or alkylated diphenylethers which may contain substituents which do not interfere with the oxidation. The oxidation temperature is at least 125° C. Selenium may be added to the reaction mixture.

3,631,098

EXTRACTING 4-p-TOLYLVALERIC ACID FROM DOUGLAS FIR

Carl T. Redemann, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 18, 1969, Ser. No. 859,186
Int. Cl. C07c *51/48*
U.S. Cl. 260—525 7 Claims

When Douglas fir wood is contacted with a suitable non-polar, water-immiscible solvent, 4-p-tolylvaleric acid is extracted. This acid may then be removed from the extract by conventional means.

3,631,099

PREPARATION OF UNSATURATED ALDEHYDES AND ACIDS

Jamal S. Eden, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 483,862, Aug. 30, 1965, now Patent No. 3,401,198. This application Aug. 28, 1967, Ser. No. 663,557
The portion of the term of the patent subsequent to Sept. 10, 1985, has been disclaimed
Int. Cl. C07c *57/04*
U.S. Cl. 260—533 N 6 Claims

Unsaturated acids and aldehydes, as acrylic acid and acrolein, are prepared together in excellent yields by the oxidation of an olefin as propylene in the presence of a catalyst containing a II–A metal molybdate, as strontium molybdate, tellurium oxide and phosphorus pentoxide.

3,631,100

PROCESS FOR THE PREPARATION OF USEFUL N_2O_3 ADDITION PRODUCTS AND FATTY ACIDS

Alan F. Ellis, Murrysville, Pa., assignor to Gulf Research & Development Corporation, Pittsburgh, Pa.

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,441
Int. Cl. C07c *53/22*
U.S. Cl. 260—533 R 13 Claims

1-alkenes, such as 1-octene, can be substantially completely converted to useful N_2O_3 addition products by reaction with a nitrosating agent comprising a mixture of NO and NO_2 wherein the molar ratio of NO to NO_2 is at least 1:1, provided the conversion occurs in the presence of a lower alkyl fatty acid such as acetic acid. The N_2O_3 addition products can be converted in good efficiency to a fatty acid by reaction with concentrated sulfuric or phosphoric acid, followed, if necessary or if desired, after gas evolution has ceased, by dilution with water to an anhydrous mineral acid content of less than 65 and heating to obtain the desired fatty acid, such as heptanoic acid.

3,631,101

p - [p - (THIONYLAMINO)BENZAMIDO]BENZOYL CHLORIDE AND ITS HCl ADDITION PRODUCT

Josef Pikl, Glassboro, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 28, 1967, Ser. No. 694,123
Int. Cl. C07c *51/58, 10/88*
U.S. Cl. 260—544 R 2 Claims

(I) p-[p-(thionylamino)benzamido] benzoyl chloride and (II) p-[p-aminobenzamido] benzoyl chloride hydrochloride and processes for their preparation. (I) is prepared by reacting p-aminobenzoic acid, p-thionylaminobenzoyl chloride and thionyl chloride in a reaction solvent. (II) is prepared by treating (I) with hydrogen chloride.

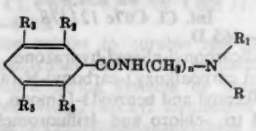
3,631,102

N-AMINOALKYL-2,5-CYCLOHEXADIENE-1-CARBOXAMIDES

Venkatachala Lakshmi Narayanan, North Brunswick, Frederic Peter Hauck, Somerville, and Frank Lee Weisenborn, Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Apr. 23, 1969, Ser. No. 818,839
Int. Cl. C07c *103/44*
U.S. Cl. 260—557 R 6 Claims

This invention relates to new N-aminoalkyl-2,5-cyclohexadiene-1-carboxamides of the general formula



and to acid addition salts thereof.

They are useful as anti-fibrillatory agents.

3,631,103

5-(3'-ALKOXY OR HALO-PROPYLIDENE)-DIBENZO [a,d]CYCLOHEPTA[1,4,6]TRIENE - 10-CARBOXYLIC ACID AMIDES

Gerald Rey-Bellet and Hans Spiegelberg, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of application Ser. No. 431,981, Feb. 11, 1965. This application Sept. 12, 1968, Ser. No. 759,499

Claims priority, application Switzerland, Feb. 18, 1964, 1,969/64; Dec. 4, 1964, 15,709/64

Int. Cl. C07c *103/30*

U.S. Cl. 260—559 R 5 Claims

Dibenzo[a,d]cyclohepta[1,4,6]trienes bearing in the 5-position, substituents such as, for example, oxo- or 3'-lower alkoxyalkylidene and in the 10-position, substituents such as, for example, carbonyl, thiocarbonyl or guanyl radicals, for instance, 5-(3'-lower alkoxypropylidene) - dibenzo[a,d]cyclohepta[1,4,6]triene 10 - carboxylic acid di-(lower alkyl)amides and dibenzo[a,d] cyclohepta[1,4,6]trien-5-one 10 - carboxylic acid cyclic amides, prepared, inter alia, from 5-(3'-lower alkoxypropylidene) - dibenzo[a,d]cyclohepta[1,4,6]triene 10-carboxylic acid, 10 - halocarbonyl - 5-(3'-lower alkoxypropylidene)dibenzo[a,d]cyclohepta[1,4,6]triene or dibenzo[a,d]cyclohepta[1,4,6]trien-5 - one 10-carboxylic acid halide, are described. The end products are useful as antidepressants.

3,631,104

CATALYSTS FOR THE HYDRATION OF NITRILES TO AMIDES

Clarence E. Habermann and Ben A. Tefertiller, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 791,807, Jan. 16, 1969. This application June 23, 1969, Ser. No. 835,765

Int. Cl. C07c *103/00*

U.S. Cl. 260—561 N 29 Claims

Copper, copper oxide, copper-chromium oxide, copper-molybdenum oxide or mixtures thereof have been found to be excellent heterogeneous catalysts for the conversion of nitriles in the presence of water to the corresponding amides. Using one such catalyst in a continuous flow reactor, acrylonitrile was almost 100% converted to acrylamide during more than six weeks of continuous operation.

3,631,105

ACETOXYMETHYL ACETAMIDES AND ACETAMIDOACETAMIDES AND THEIR PREPARATION

Stanley C. Bell, Montgomery, Ronald J. McCaully, Chester, and Scott J. Childress, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 456,533, May 17, 1965, and Ser. No. 677,029, Oct. 23, 1967. This application June 8, 1970, Ser. No. 44,547

Int. Cl. C07c *103/44*

U.S. Cl. 260—562 N 1 Claim

A process is disclosed in which an N[(4-oxo-4H-3,1-benzoxazin-2-yl)acyloxymethyl] lower fatty acid amide is prepared by a reaction of an acid anhydride with a substituted aminoacetyl anthranilic acid. The reaction product is then treated with a compound possessing an active hydrogen and a nucleophilic group, i.e., an amine, whereby there is formed a 2-carbamyl-acetanilide in which one nucleophilic group attaches to the methylene radical of the acetyl group and another to the carbonyl group of the acetanilide. The compounds of the invention are central nervous system depressants, resulting in a generally relaxing or sedative effect.

3,631,106

NOVEL NAPHTHALENEDIAMINE COMPOUNDS AND MEANS FOR THEIR PRODUCTION

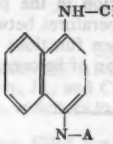
Edward F. Elslager, 4081 Thornoaks Drive, Ann Arbor, Mich. 48104

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,799

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 F 5 Claims

Naphthalenediamine compounds of Formula I are provided by reacting N-[2-(diethylamino)ethyl]-1,4-naphthalenediamine with the appropriate aldehyde OA, specifically: (a) o-nitrocinnamaldehyde, (b) 4-dimethylaminocinnamaldehyde or (c) benzaldehyde monosubstituted by halogen, CH_3CONH, NO_2, CN, CH_3 or OH and optionally containing 1 or 2 substituents selected from Cl, CH_3 and CH_3O. The products have antiparasitic properties and are useful schistosomacides.



(I)

3,631,107

N,N'-BIS(ACENAPHTHENYLMETHYL)-CYCLOHEXANEBIS(METHYLAMINES) AND THE SALTS THEREOF

Leslie G. Humber, Dollard des Ormeaux, Quebec, Canada,, assignor to Ayerst, McKenna and Harrison Limited, St. Laurent, Quebec, Canada

No Drawing. Filed Oct. 24, 1969, Ser. No. 869,321

Int. Cl. C07c *87/28*

U.S. Cl. 260—570.5 PA 18 Claims

Disclosed herein are N,N^1-bis(5-acenaphthenylmethyl)-1,3- and -1,4-cyclohexanebis(methylamines) and their corresponding mono- or di-N-(lower alkyl) derivatives, as well as their acid addition salts with pharmaceutically acceptable acids. The compounds and their acid addition salts are useful in preventing the excessive secretion of gastric acid, and methods for their preparation and use are given.

3,631,108

PARA-ALKENYLPHENOXY-HYDROXY-ISOPROPYLAMINOPROPANE

Arne Elof Brandstrom, Goteborg, Hans Rudolf Corrodi, Askim, and Bengt Arne Hjalmar Ablad, Goteborg, Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

No Drawing. Division of application Ser. No. 808,316, Mar. 18, 1969, now Patent No. 3,555,161, and a continuation-in-part of applications Ser. No. 521,436, Jan. 18, 1966, now Patent No. 3,466,325, and Ser. No. 558,226, June 17, 1966, now Patent No. 3,466,376. This application Aug. 15, 1969, Ser. No. 872,789

Claims priority, application Sweden, Apr. 30, 1965, 5,711/65

Int. Cl. A61k *27/00*; C07c *93/06*

U.S. Cl. 260—570.7 1 Claim

Para - allyl substituted phenoxy - hydroxy - isopropylaminopropane, its preparation, pharmaceutical compositions containing this compound, and the use thereof in the treatment of cardiac and vascular diseases.

3,631,109

β,β'-BIS[DIALKYLAMINOMETHYL-4-HYDROXY-BENZYLTHIO]DIALKYLETHERS

Francis X. O'Shea, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Dec. 4, 1968, Ser. No. 781,247

Int. Cl. C07c *87/28*

U.S. Cl. 260—570.9 3 Claims

This invention is concerned with a new series of compounds found to be useful as antioxidants, and their

method of production. The compounds described as bisphenolic antioxidants are particularly effective for retarding oxidative deterioration in rubber, plastics, fats and petroleum products.

3,631,110
PREPARATION OF KETONES
Richard D. Smetana, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.
No Drawing. Filed Oct. 29, 1968, Ser. No. 771,599
Int. Cl. C07c *45/02*
U.S. Cl. 260—597 R **5 Claims**

A method for producing ketones by contacting an n-paraffin having from 3 to 25 carbon atoms with a nitrating agent selected from the group consisting of N_2O_5 and a P_2O_5—HNO_3—H_2O combination in the presence of an oxygen containing gas at temperatures between —50 and 50° C. The presence of oxygen functions as a nitration director favoring the production of ketones.

3,631,111
OXO PROCESS
Edmond R. Tucci, Murrysville, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Dec. 17, 1968, Ser. No. 784,479
Int. Cl. C07c *45/10*
U.S. Cl. 260—604 HF **17 Claims**

An Oxo process wherein an olefin is reacted with hydrogen and carbon monoxide in the presence of a catalyst system wherein the major portion thereof is a Group VI–B metal carbonyl complexed with a compound of trivalent phosphorus, trivalent arsenic or trivalent antimony and a minor portion thereof is a metal hydro carbonyl wherein the metal can be cobalt, rhodium, iridium, palladium, iron, nickel, ruthenium, osmium, manganese or rhenium.

3,631,112
POLYBROMO-CYCLOALIPHATIC ETHERS
Paul M. Kerschner, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.
No Drawing. Filed Dec. 29, 1967, Ser. No. 694,423
Int. Cl. C07c *43/18*
U.S. Cl. 260—611 R **4 Claims**

A unique group of high boiling water insoluble polyhaloalkyl and cycloalkyl ethers is described, all of which are useful as external plasticizers and flame retarders for thermoplastic organic polymers, such as polyethylene, polystyrene and polymethylmethacrylate.

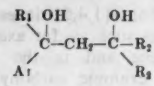
These plasticizer/flame retarder compositions are advantageously produced by adding a solution of halogen, such as bromine, in a lower aliphatic alcohol to a multi-unsaturated aliphatic or cycloaliphatic hydrocarbon and then adding sufficient water to the reaction mixture to separate the desired product as an insoluble lower liquid phase.

3,631,113
2-METHOXY-5-METHYL-m-XYLYLENE DICHLORIDE
Harold Marvin Foster, Park Forest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio
No Drawing. Filed Oct. 13, 1969, Ser. No. 865,945
Int. Cl. C07c *43/28*
U.S. Cl. 260—612 D **1 Claim**

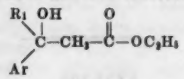
A novel compound, 2-methoxy-5-methyl-m-xylylene dichloride, is synthesized by reacting 2,6-bis(hydroxymethyl)-4-methylanisole with thionyl chloride. The product is useful in the manufacture of 2,6-bis(alkylthiomethyl)-4-methylanisoles.

3,631,114
DITERTIARY BETA-DIOLS
Raymond Valette, Paris, France, assignor to Les Laboratoires Albert Rolland, Paris, France
No Drawing. Continuation-in-part of application Ser. No. 262,849, Mar. 5, 1963. This application Aug. 2, 1968, Ser. No. 749,574
Int. Cl. C07c *31/14*
U.S. Cl. 260—618 D **3 Claims**

A process for the preparation of ditertiary beta-diols of the general Formula I



in which R_1 and R_2 represent identical or different lower alkyl radicals, and Ar represents an aryl radical which may be a phenyl or a para-halogen such as chlorine, bromine or fluorine, substituted phenyl radical, which comprises effecting reaction between a hydroxyester of the formula



and an organomagnesium compound of the formula R_2MgX, in which R_1, Ar and R_2 have the meaning stated above and X is a halogen atom, in a molar ratio of 1:3, and hydrolysing the product.

New compounds of Formula I in which R_1 and R_2 have different numbers of carbon atoms.

3,631,115
TELOMERIZATION PROCESS FOR THE PREPARATION OF HALOGENATED HYDROCARBONS
Kunio Nakagawa, Nishinomiya-shi, Hyogo, and Tadashi Nakata, Ibaragi-shi, Osaka, Japan, assignors to Shionogi & Co. Ltd., Osaka, Japan
No Drawing. Application Mar. 7, 1967, Ser. No. 621,151, now Patent No. 3,429,934, dated Feb. 25, 1969, which is a division of application Ser. No. 252,554, Jan. 12, 1963, now Patent No. 3,309,393, dated Mar. 14, 1967. Divided and this application Feb. 28, 1968, Ser. No. 734,181
Int. Cl. C07c *17/08, 17/10, 17/28*
U.S. Cl. 260—648 C **6 Claims**

A taxogen selected from the group consisting of alkenes with a maximum of 8 carbon atoms, the corresponding halogenoalkanes and halogenoalkenes, butadiene and isoprene, is telomerized with a telogen selected from the group consisting of halogeno(lower)alkanes, halogenoethylenes and hydrohalic acids with production of addition product thereof in the form of halogenated hydrocarbon, by reacting the telogen with the taxogen in the presence of nickel peroxide at a temperature from ambient temperature to the decomposition temperature of one of the telogen, the taxogen and their addition product, the said nickel peroxide being the product of the treatment of a salt of nickel selected from the group consisting of nickel chloride, nickel bromide, nickel sulfate, nickel carbonate and nickel nitrate with an oxidizing agent selected from the group consisting of alkali hypohalite and alkali persulfate in aqueous alkaline medium at a temperature between 10° and 25° C., and containing about 0.3 to 0.4×10^{-2} gram-atom of active oxygen per gram.

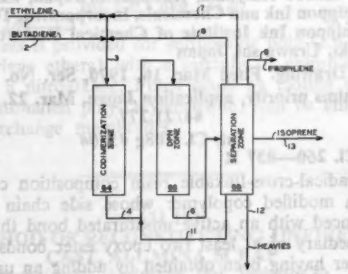
3,631,116
PROCESS FOR THE MANUFACTURE OF CARBON TETRACHLORIDE
Lothar Hornig, Helmut Meidert, and Wilhelm Riemenschneider, all of Farbwerke Hoechst AG, Frankfurt am Main, Germany
No Drawing. Filed Jan. 8, 1969, Ser. No. 789,965
Claims priority, application Germany, Jan. 12, 1968, P 16 68 074.3
Int. Cl. C07c 17/10, 17/24, 19/06
U.S. Cl. 260—662 R 2 Claims

Improvement in a process for the manufacture of carbon tetrachloride by chlorination of aromatic hydrocarbons consisting in maintaining the intermediately formed hexachlorobenzene in solution in carbon tetrachloride at elevated temperature and pressure and removing it in this form or returning it continuously to a chlorolysis reaction.

3,631,117
HYDROISOMERIZATION OF CYCLIC COMPOUNDS WITH SELECTIVE ZEOLITE CATALYSTS
Stephen M. Kovach and Ronald A. Kmecak, Ashland, Ky., assignors to Ashland Oil & Refining Company, Houston, Tex.
No Drawing. Filed Dec. 19, 1968, Ser. No. 785,375
Int. Cl. C07c 3/00
U.S. Cl. 260—666 10 Claims

Cyclic organic compounds, such as toluene, methylcyclohexane, hydronaphthalenes, etc., are hydroisomerized to produce isomeric products, such as dimethylcyclopentanes and alkyl indanes and hydrindanes, respectively, by contacting the cyclic compound with a catalyst of an active metal selected from the group consisting of a metal of Group VIII of the Periodic System, particularly platinum, palladium, rhodium, nickel or cobalt, molybdenum and rhenium, alone or in combination with one another, or in combination with other catalytic metals, such as tungsten, etc., deposited or exchanged on a zeolite base, such a calcium type Y zeolite, a hydrogen type Z (Mordenite) zeolite, etc., while maintaining conditions sufficient to cause rupture of at least one ring of the cyclic compound, as between 400 and 1000° F., 0 and 2000 p.s.i.g., 0.1 and 10 liquid hourly space velocity, and 1 and 20 to 1 moles hydrogen at aromatic feed.

3,631,118
ISOPRENE FROM ETHYLENE USING OLEFIN DISPROPORTIONATION
Robert L. Banks, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Jan. 8, 1970, Ser. No. 1,434
Int. Cl. C07c 3/62, 11/18
U.S. Cl. 260—680 R 7 Claims



A process of preparing isoprene from ethylene wherein ethylene and butadiene are codimerized to produce a branched acyclic diene, the branched acyclic diene is contacted with an olefin disproportionation catalyst in the presence of ethylene to produce the isoprene. The butadiene can conveniently be provided by the olefin disproportionation of propylene to provide ethylene and butenes, and subsequent dehydrogenation of the butenes.

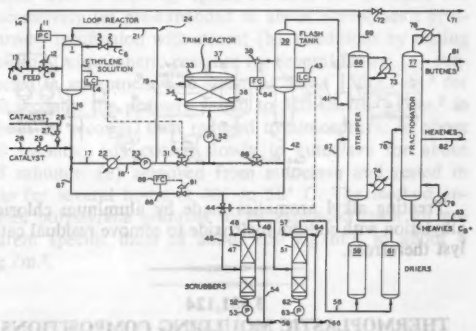
3,631,119
REMOVAL OF CARBONYLS FROM POLYMERIZABLE MONOMERS
Donald M. Haskell, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Jan. 8, 1970, Ser. No. 1,555
Int. Cl. C07c 5/18, 7/00
U.S. Cl. 260—681.5 6 Claims

Carbonyl compounds are removed from a butadiene-containing stream by contacting the stream with formamide.

3,631,120
ALKYLATION OF AROMATIC HYDROCARBONS
Paul E. Eberly, Jr., and Charles N. Kimberlin, Jr., Baton Rouge, La., assignors to Esso Research and Engineering Company
No Drawing. Filed June 13, 1969, Ser. No. 833,168
Int. Cl. C07c 3/52
U.S. Cl. 260—671 14 Claims

A process for alkylation of aromatic hydrocarbons, especially monocyclic aromatic hydrocarbons, with olefins, especially C_2 to C_{16} monoolefins and more preferably C_2 to C_5 monoolefins, by liquid phase reaction in the presence of an ammonium-ion exchanged, calcined zeolite having a silica-to-alumina ratio ranging from about 4.0 to about 4.9.

3,631,121
DIMERIZATION OF C_2 TO C_{10} OLEFINS WITH DEPOSITED CATALYST
Thomas Hutson, Jr., and Cecil O. Carter, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed May 12, 1969, Ser. No. 823,618
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 9 Claims



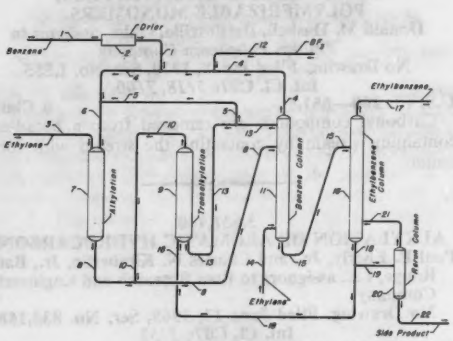
In the dimerization of C_2 to C_{10} olefins in a loop reactor, the improvement comprising running the reactor hotter than normal for a short period of time until catalyst and polymer are deposited on the walls of the loop reactor making the reactor more selective for dimerization, and then returning to the usual reaction temperatures. As a second feature, by running the effluent from the loop reactor through a fixed bed of ion exchange resin, some of the catalyst from the stream deposits on the ion exchange resin, and there acts as a second catalyst bed selective for dimerization.

3,631,122

ALKYLATION PROCESS

Charles V. Berger, Western Springs, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 24, 1970, Ser. No. 13,632
Int. Cl. C07c 3/56
U.S. Cl. 260—671 14 Claims



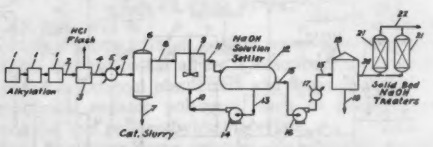
Non-volatile boron oxide hydrates produced during the alkylation of an alkylatable aromatic hydrocarbon with an olefin-acting compound in the presence of a boron halide and a boron halide modified inorganic oxide are removed by reacting the boron oxide hydrate with an olefin-acting compound and removing the resultant reaction product.

3,631,123

METHOD FOR TREATING ALKYL AROMATICS

Matthew L. Becker, Philadelphia, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

Continuation-in-part of abandoned application Ser. No. 756,664, Aug. 30, 1968. This application Feb. 16, 1970, Ser. No. 11,824
Int. Cl. C07c 7/00, 3/56
U.S. Cl. 260—674 A 8 Claims



Treating alkyl aromatics made by aluminum chloride alkylation with sodium hydroxide to remove residual catalyst therefrom.

3,631,124

THERMOPLASTIC MOULDING COMPOSITIONS ON THE BASIS OF POLYACETALS

Karlheinz Burg, Hofheim, Taunus, Klemens Gutweiler, Oberjosbach, Taunus, and Harald Cherdron, Wiesbaden, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Sept. 26, 1968, Ser. No. 763,015
Claims priority, application Germany, Oct. 13, 1967, P 16 94 206.6
Int. Cl. G08g 37/04, 37/38
U.S. Cl. 260—823 7 Claims

The invention provides thermoplastic moulding compositions on the basis of polyacetals having an improved impact strength which are obtained by mixing a polyoxymethylene, for example a homo- or copolymer of formaldehyde or trioxan, with a polyether, for example polyethylene oxide.

3,631,125

ADDUCTS OF m-TOLYLENEDIAMINE AND CURABLE POLYEPOXIDE COMPOSITIONS BASED ON m-TOLYLENEDIAMINE AND ADDUCTS THEREOF

George A. Salensky, Metuchen, N.J., assignor to Union Carbide Corporation

No Drawing. Filed Jan. 16, 1968, Ser. No. 698,140
Int. Cl. C08g 45/06, 30/08
U.S. Cl. 260—830 R 6 Claims

This invention relates to adducts of m-tolylenediamine and liquid polyglycidylethers; to adducts of m-tolylenediamine and a lactone; to curable polyepoxide compositions based on these adducts and to solid, thermosetting reaction products of m-tolylenediamine and liquid polyepoxides. These compositions and reaction products can be used to encapsulate electrical components making the components resistant to thermal and mechanical shock.

3,631,126

POLYPHENYLENE OXIDE RESINS MODIFIED WITH POLYHYDROXY ETHERS

Hugh E. Snodgrass, Mishawaka, and Robert L. Lauchlan, Granger, Ind., assignors to Uniroyal, Inc., New York, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,452
Int. Cl. C08g 45/06, 45/00, 9/02
U.S. Cl. 260—830 R 27 Claims

Blends of poly(phenylene ether) resins with poly (hydroxy ether) resins provide thermoplastic compositions characterized by unique properties, particularly, significantly reduced melt viscosities and correspondingly improved melt processing characteristics, as well as increased stiffness and rigidity.

3,631,127

POLYMERIZABLE ADDUCT OF CARBOXY CONTAINING COPOLYMER AND MONOESTERS OF DIEPOXIDES AND UNSATURATED MONOCARBOXYLIC ACID WITH VINYL MONOMERS

Shozaburo Nomura and Kiyoshi Honda, Osaka, Mitsumasa Miyazaki, Amagasaki, Kazutoyo Hirose, Tokyo, and Katsuo Akiyama, Kawaguchi, Japan, assignors to Dainippon Ink and Chemicals, Incorporated, Tokyo, and Dainippon Ink Institute of Chemical Research, Kamikizaki, Urawa-shi, Japan

No Drawing. Filed Mar. 16, 1970, Ser. No. 20,081
Claims priority, application Japan, Mar. 22, 1969, 44/21,277
Int. Cl. C08g 45/04
U.S. Cl. 260—837 R 4 Claims

A radical-cross-linkable resin composition comprising (A) a modified copolymer whose side chain has been introduced with an active unsaturated bond through the intermediary of at least two epoxy ester bonds, said copolymer having been obtained by adding an unsaturated epoxy resin to a polycarboxy copolymer; and (B) a monomer copolymerizable with the unsaturated bond of the side chain of said modified copolymer, the amount of (B) being at least 5% by weight of (A). This radical-cross-linkable resin composition can form a coating having excellent properties.

3,631,128
POLYMERS STABILIZED WITH ORGANIC SULFIDES AND PHOSPHITES
Richard Strauss, Lexington, and James Bottomley, Andover, Mass., assignors to National Polychemicals, Inc., Wilmington, Mass.
Continuation-in-part of applications Ser. No. 443,174, Mar. 26, 1965, now Patent No. 3,435,097, and Ser. No. 462,385, June 8, 1965, now Patent No. 3,367,996; applications Ser. No. 538,022, Mar. 28, 1966, now Patent No. 3,526,679, and Ser. No. 675,299, Oct. 16, 1967, being a division of said application Ser. No. 462,385; and Ser. No. 831,744, June 9, 1969, now Patent No. 3,527,725, being a continuation-in-part of said application Ser. No. 675,299. This application Aug. 27, 1970, Ser. No. 67,487
Int. Cl. C08g *37/18, 51/58*
U.S. Cl. 260—845 **10 Claims**

An organic polymer subject to degradation, e.g., a C_2–C_4 olefin resin or synthetic elastomer, is stabilized by a composition composed of:

(a) an alkylated phenol polysulfide; and

(b) a phosphorus-containing ester polymer prepared by the reaction of a trivalent phosphorus compound, such as phosphorus trichloride and a thermoplastic phenol-formaldehyde novolak resin.

3,631,129
METHOD OF PREPARING INORGANIC POLYMERS
Piero Luigi Nannelli, King of Prussia, and Hyman David Gillman, Norristown, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.
No Drawing. Filed Apr. 7, 1970, Ser. No. 26,394
Int. Cl. C08g *33/16, 33/20*
U.S. Cl. 260—2 P **5 Claims**

Chromium(III) hydroxyaquo bis(phosphinate) polymers composed of the recurring unit

$$[Cr(H_2O)(OH)(OPR_1R_2O)_2]$$

where R_1 and R_2 are inert organic groups, are prepared by reacting chromium(III) hydroxide with substituted phosphinic acids in aqueous medium. The polymers are used as coatings which will be subjected to high temperature environment.

3,631,130
METHOD FOR SULFONATING POLY-(ARYLENEOXIDE)
Johann F. Klebe, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Filed June 26, 1970, Ser. No. 50,338
Int. Cl. C08g *23/20*
U.S. Cl. 260—2.2 **5 Claims**

A process is provided for sulfonating poly-(2,6-diaryl-1,4-phenylene ethers) with a mixture of chlorosulfonic acid and a nitroalkane. Films made by casting the resulting sulfonated poly-(aryleneoxide) can be employed as ion exchange membranes.

3,631,131
METHOD OF RECONSTITUTING UNFIRED, CAST, ALUMINA SCRAP
Paul Kopko, Anderson, Ind., assignor to RCA Corporation
No Drawing. Filed May 4, 1970, Ser. No. 34,599
Int. Cl. C08f *47/24*
U.S. Cl. 260—2.3 **11 Claims**

Unfired, cast, alumina scrap, comprising components of aluminum oxide, inorganic additives, a plasticizer, and a binder, is reconstituted into a slip suitable for recasting by first milling a charge of the scrap with an excess of solvent for the binder in a slip ball mill. The scrap is milled until the binder dissolves and the scrap is broken down into its components. Then, an additional charge, comprising components similar in chemical composition to those in the broken-down scrap, is added to the contents of the slip ball mill in a quantity to provide at least 25%, by weight, of a total charge for the slip mill. The total charge is milled with the aforementioned excess of solvent to provide the recasting slip wtih a viscosity of between 20,000 and 35,000 centipoises.

3,631,132
FLAME RESISTANT EXPANDABLE STYRENE POLYMERS CONTAINING TRIBROMOPHENYL-DIBROMOPROPYL ETHER AND METHOD OF PREPARING
Helmut Westernacher, Hans-Wolfgang Jurgeleit, and Anton Schick, Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany
No Drawing. Filed Aug. 12, 1970, Ser. No. 63,329
Claims priority, application Germany, Sept. 13, 1969, P 19 46 441.6
Int. Cl. C08j *1/26*
U.S. Cl. 260—2.5 FP **16 Claims**

Flame resistant expandable styrene polymers prepared by treating the styrene polymers in an aqueous suspension at temperatures of between about 80 and 150° C. with tribromophenyldibromopropyl ether in the liquid phase.

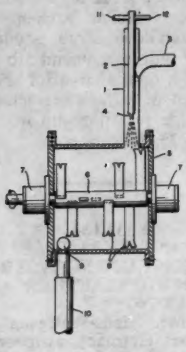
3,631,133
PROCESS FOR EXPANDING POLYSTYRENE
Jean Battigelli, Rantigny, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France
No Drawing. Filed Apr. 13, 1966, Ser. No. 542,236
Claims priority, application France, Apr. 14, 1965, 13,185
Int. Cl. C08f *47/10, 33/02*
U.S. Cl. 260—2.5 B **8 Claims**

Method for expanding granules of polystyrene impregnated with a blowing agent, wherein the granules are successively (a) pre-expanded at about atmospheric pressure by insufflation with steam; (b) conditions by resting in silo at atmospheric pressure for several hours; (c) subjected in an autoclave to steam at about 150 g./cm.^{2} for 30 seconds, the pressure raised to 500 to 700 g./cm.^{2} in about 10 seconds, then reduced to atmospheric in about 10 seconds: (d) cooled slowly in autoclave for about 25 minutes; (e) removed from autoclave and rested in silo for several hours at 40° to 50° C. The method enables polystyrene granules to be expanded from an apparent specific mass of about 650 kg./m.^{3}, to about 4 kg./m.^{3}.

3,631,134
PROCESS FOR THE CONTINUOUS PRODUCTION OF FOAMS FROM CURABLE SYNTHETIC RESINS
Hans Scheuermann and Wilhelm Krieger, Ludwigshafen, Rhine, and Leo Unterstenhoefer, Limburgerhof, Pfalz, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany
Filed Feb. 23, 1967, Ser. No. 618,039
Claims priority, application Germany, Feb. 26, 1966, P 16 29 276.5
Int. Cl. C08f *47/10;* **C08v** *1/16*
U.S. Cl. 260—2.5 F **2 Claims**

A continuous process for the production of foams from curable synthetic resins in which aqueous solutions are foamed by means of foaming agents, the resultant foams

are mixed with aqueous solutions of resins in a pre-mixing zone and then in a main mixing zone and the mixtures



are discharged from the mixing zone and cured, as well as an apparatus for carrying out the process.

3,631,135

INK COMPOSITION FOR IMPARTING HIGH GLOSS TO MELAMINE RESIN ARTICLES

Patrick J. McGuire, 123 Magnolia Ave., Mount Vernon, N.Y. 10503

No Drawing. Continuation-in-part of application Ser. No. 707,324, Feb. 21, 1968. This application Feb. 2, 1970, Ser. No. 7,320

Int. Cl. B32b *27/42*; C08b *27/14*

U.S. Cl. 260—17 10 Claims

A water-soluble, high gloss ink for imparting a gloss to molded articles such as articles molded from melamine resin is obtained from compositions comprising from about 25–50 parts by weight of a synthetic pearl pigment and from about 75–50 parts by weight of a vehicle comprising water, polyvinyl alcohol and a thickening agent. Based on total composition in the liquid state, water may be present in an amount of from about 40–65 parts, the polyvinyl alcohol may be present in an amount of from about 5–20 parts, and the thickening agent may be present in an amount of from about 0.1–3 parts.

3,631,136

WHITE TO LIGHT-COLORED, DETERGENT-RESISTANT COATING COMPOSITION

Lester L. Spiller, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

No Drawing. Filed Aug. 18, 1965, Ser. No. 480,760

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.3 23 Claims

White or light-colored aqueous coating compositions suitable for an electrophoretic coating process and exceptionally resistant to discoloration and detergents comprise (1) a polyester resin which has an acid number of 40 to 70 and which is a condensation product of an aromatic acid having more than two carboxyls, alkylene glycols (preferably in excess), and a saturated dicarboxylic acid, (2) a di- to hexa-alkoxyalkylene-substituted polyamine crosslinking agent, and (3) a suitable pigment. The resin is preferably solubilized by reaction with ammonia or an amine (preferably a tertiary amine). The composition is applied by impressing a sufficient voltage between an electrode and the article to be coated to provide an initial current density of at least 300 milliamperes per square foot of surface.

3,631,137

POLYEPOXIDES CONTAINING AMIDE DILUENTS

Kevin Kromer Kipp, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,497

Int. Cl. C08g *51/26, 51/44*

U.S. Cl. 260—30.4 EP 10 Claims

Various N-oxoalkyl and N-hydroxyalkyl amides, especially diacetone acrylamide and compounds derived therefrom, reduce the viscosity of epoxy resins. The physical properties of the resins, both before and after curing, are not substantially damaged by the addition of such diluents.

3,631,138

SOLUTION STABLE URETHANE POLYMER COMPOSITIONS AND PRODUCTS THEREFROM

Timothy Victor Peters, Rte. 2, Rockaway Road, Lebanon, N.J. 08833

No Drawing. Continuation of application Ser. No. 699,362, Jan. 22, 1968, which is a continuation-in-part of application Ser. No. 618,280, Feb. 17, 1967. This application Apr. 24, 1970, Ser. No. 29,752

Int. Cl. C08g *51/44, 22/06*

U.S. Cl. 260—32.6 N 12 Claims

A high molecular weight polyurethane having a segment derived by chain extension of a prepolymer formed by the reaction of a hydroxyl-terminated polymer with at least two diisocyanates, one having no substituents alpha to the isocyanate groups and another having a substituent alpha to an isocyanate group; and processes for the preparation thereof which include the above reactions.

3,631,139

THERMOSETTING ORGANOPOLYSILOXANE MOLDING MATERIALS

Ignaz Bauer and Siegfried Nitzsche, Burghausen, Upper Bavaria, Germany, Rudolf A. Riedle, Adrian, Mich., and Werner Graf, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

No Drawing. Filed Apr. 23, 1970, Ser. No. 31,401

Claims priority, application Germany, Apr. 23, 1969, P 19 20 691.8

Int. Cl. C08g *51/34*

U.S. Cl. 260—32.8 SB 10 Claims

Adding a ketone or metallanolate of a ketone to a polysiloxane composition containing phenyl substituents and residual hydroxyl groups and cured with lead compounds as a molding composition improves the shelf life, reduces the curing time, improves flowability of the composition and produces improvement in the physical properties of the cured molded product.

3,631,140

PROCESS FOR PREPARING POLYTETRAFLUOROETHYLENE ORGANOSOLS

James C. Fang, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of applications Ser. No. 413,333, Nov. 23, 1964, Ser. No. 528,047, Feb. 17, 1966, Ser. No. 654,333, July 19 1967 and Ser. No. 738,825, June 21, 1968. This application July 1, 1970, Ser. No. 51,723

Int. Cl. C08f *45/28, 45/34, 47/16*

U.S. Cl. 260—33.4 F 5 Claims

A process for preparing dispersions of polytetrafluoroethylene in organic liquids which comprises mixing particulate polytetrafluoroethylene and an organic liquid having a surface tension below about 25 dynes per centimeter and then milling the mixture.

3,631,141

PROCESS FOR PREPARING POLYTETRAFLUOROETHYLENE ORGANOSOLS

James C. Fang, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of applications Ser. No. 413,333, Nov. 23, 1964, Ser. No. 528,047, Feb. 17, 1966, Ser. No. 654,333, July 19, 1967, Ser. No. 738,822, June 21, 1968, and Ser. No. 19,904, Mar. 12, 1970. This application July 1, 1970, Ser. No. 51,724

Int. Cl. C08f *45/28, 45/34, 47/20*
U.S. Cl. 260—33.4 F 3 Claims

A process for preparing a dispersion of polytetrafluoroethylene in an organic liquid, which comprises mixing an organic liquid with an aqueous dispersion of polymer, boiling the mixture, taking off the resulting azeotrope, separating the water from the azeotrope and returning the organic liquid to the boiling mass until it is substantially anhydrous.

3,631,142

METHOD TO INCREASE THE TENSILE STRENGTH OF UNCURED RUBBERY BLOCK COPOLYMERS

Clifford W. Childers, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Mar. 30, 1967, Ser. No. 626,950

Int. Cl. C08f *19/08, 47/20*
U.S. Cl. 260—33.6 A 5 Claims

Rubbery block copolymer of a conjugated diene and a monovinyl substituted aromatic compound, or a mixture of resinous block copolymer of a conjugated diene and a monovinyl substituted aromatic compound with a sulfur vulcanizable rubbery polymer is treated with at least one of a peroxy oxygen-containing compound, an organoaluminum halide, an inorganic acid, an inorganic halide, and a phosphorus oxyhalide.

3,631,143

METHOD FOR IMPROVING GREEN STRENGTH OF VULCANIZABLE BUTYL RUBBER COMPOUNDS

Alexander J. Rizzer, Akron, Ohio, assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Jan. 21, 1970, Ser. No. 4,785

Int. Cl. C08g *51/04*
U.S. Cl. 260—38 2 Claims

Green strength of vulcanizable elastomeric compositions which contain carbon black and butyl rubber is improved by the addition of a thermoplastic terpene phenol-formaldehyde Novolak resin containing a trace of free methylol.

3,631,144

VISCOSITY BUILDUP OF POLYESTER RESINS

William H. Deis, Belmont, and Gerald Bohm, Albany, Calif., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation of application Ser. No. 833,750, June 16, 1969. This application May 19, 1970, Ser. No. 37,481

Int. Cl. C08f *21/02*
U.S. Cl. 260—40 R 6 Claims

A polyester resin system possessing a rapid viscosity buildup is produced by combining with said resin (1) magnesium hydroxide and (2) a potentiating agent, said agent being a liquid polyol.

3,631,145

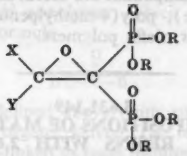
FLAME RESISTANT POLYMERS

Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Apr. 13, 1970, Ser. No. 27,986

Int. Cl. C08f *45/00;* C08g *51/00;* C09k *3/28*
U.S. Cl. 260—45.8 A 16 Claims

Organic compositions containing a substituted epoxy ethane polyphosphonate having the formula



wherein R is hydrogen or an organic radical and X and Y are hereinafter defined. The compositions are fire resistant.

3,631,146

POLYMERIC MATERIALS

Peter James Briggs, John Langshaw Brooks, and David Crawford Eaton, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation of application Ser. No. 647,602, June 21, 1967. This application Apr. 15, 1970, Ser. No. 28,207

Claims priority, application Great Britain, June 27, 1966, 27,869/66

Int. Cl. C08g *22/04, 51/62*
U.S. Cl. 260—45.75 N 3 Claims

Nickel di(hydrocarbyl) dithiophosphates are included as stabilising agents in polyurethane compositions, particularly foams. The said nickel compounds may be advantageously used in conjunction with a nickel or zinc β-keto-enolate or a zinc di(hydrocarbyl dithiophosphate.

3,631,147

PREPARATION OF MONOCATION SALTS OF N,N,N',N' - TETRAKIS(p-DIALKYL AMINOPHENYL)-p-PHENYLENEDIAMINES

Peter Vincent Susi, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed June 24, 1970, Ser. No. 49,534

Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 R 7 Claims

Monocation salts of N,N,N',N'-tetrakis(p-dialkyl aminophenyl)-p-phenylenediamines are prepared in situ in the system where they are to be used, e.g., in a plastic system, by reaction of the corresponding p-quinonediimonium salts with the corresponding unoxidized N,N,N',N'-tetrakis(p-dialkyl aminophenyl)-p-phenylenediamine.

3,631,148

2,6-BIS(3,5-DIALKYL-4-HYDROXYBENZYL) CYCLOALKANONES

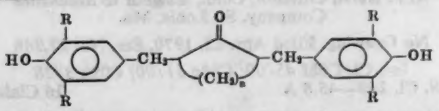
Robert A. Krueger, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Original application Nov. 1, 1967, Ser. No. 679,622. Divided and this application Apr. 9, 1970, Ser. No. 31,442

Int. Cl. C08f *45/58*
U.S. Cl. 260—45.85 6 Claims

Disclosed are novel 2,6-bis(3,5-dialkyl-4-hydroxybenzyl)cycloalkanones which are useful antioxidants for

olefin polymers. The particular 2,6-bis(3,5-dialkyl-4-hydroxybenzyl)cycloalkanones of this invention have the formula



wherein R is a hydrocarbon radical and *n* is an integer of 2 or 3. These compounds are useful as protective agents for poly(ethylene), poly(4-methylpentene-1), poly(propylene) and other olefin polymers.

3,631,149

CURABLE COMPOSITIONS OF MATTER COMPRISING EPOXY RESINS WITH 2,6 - XYLENYL-BIGUANIDE

Hans Gempeler, Muttenz, and Paul Zuppinger, Arlesheim, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed May 14, 1970, Ser. No. 37,300
Claims priority, application Switzerland, May 19, 1969, 7,678/69
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EN **5 Claims**

Curable moulding and coating compositions which contain an epoxide resin, for example a polyglycidyl ether, which is solid at room temperature, of a polyphenol such as bisphenol A, as well as 2,6-xylenyl-biguanide as the curing agent. The curable mixtures are suitable for use as single-component systems of good storage stability which rapidly cure in the temperature range of 130–200° C. (sintering powders or prepregs). Compared to other aromatic biguanides, 2,6-xylenylbiguanide has the advantage, as a curing agent, of a greater latency or longer gel time for about equal curing time.

3,631,150

SYNERGISTIC COMPOSITION FOR CURING POLYEPOXIDES COMPRISING AN IMIDAZOLE COMPOUND AND DICYANDIAMIDE

Gary M. Green, Concord, Calif., assignor to The Dexter Corporation, Hysol Division, Pittsburg, Calif.

No Drawing. Continuation-in-part of application Ser. No. 627,665, Apr. 3, 1967. This application May 20, 1970, Ser. No. 39,155
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EN **7 Claims**

The disclosure describes a new process and composition resulting therefrom for curing polyepoxides by mixing and reacting the polyepoxides at elevated temperatures with a mixture of dicyandiamide and an imidazole compound. The disclosure further describes a process for utilizing the composition in the preparation of fast curing adhesives.

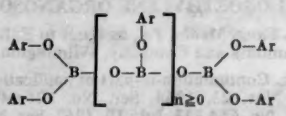
3,631,151

PROCESS FOR THE MANUFACTURE OF THERMO-SETTING SYNTHETIC RESINS COMPRISING CONDENSING AN OPEN CHAIN ARYL BORATE WITH FORMALDEHYDE

Franz Josef Huster, Troisdorf, Germany, assignor to Dynamit Nobel A.G., Troisdorf, Germany

No Drawing. Continuation-in-part of applications Ser. No. 523,027, Jan. 26, 1966, Ser. No. 706,714, Feb. 16, 1968, Ser. No. 838,043, June 24, 1969, and Ser. No. 143,995, Sept. 28, 1969. This application July 13, 1970, Ser. No. 54,601
Claims priority, application Germany, Sept. 30, 1960, D 34,395
Int. Cl. C08g *5/06, 33/18*
U.S. Cl. 260—51 R **8 Claims**

Novel mixed aryl borates of the general formula $BO_x(OAr)_y$, wherein x is greater than 0 but less than 1 and y is less than 1, which mixture contains open chain aryl borates of the formula:



which mixed aryl borates are made by reacting less than 3 mols of a phenolic compound per boron atom with boric acid or boric oxide at elevated temperatures and for extended periods of time sufficient to condense the boron compound and the phenolic compound and cause water as well as phenolic compound to be condensed out of the reaction and removed therefrom. These mixed aryl borates are reactable with formaldehyde or formaldehyde yielding materials to produce thermo-setting resins of the phenol-aldehyde type containing boron therein.

3,631,152

ETHYLENE UREA TERMINATED PHENOLIC RESINS AND METHOD OF CURING SAME

Calvin K. Johnson, Palos Heights, and David R. Armbruster, Addison, Ill., assignors to CPC International Inc.

No Drawing. Original application Apr. 18, 1968, Ser. No. 722,220, now Patent No. 3,546,172, dated Dec. 8, 1970. Divided and this application June 17, 1970, Ser. No. 47,138
Int. Cl. C08g *5/18, 9/24*
U.S. Cl. 260—51.5 **16 Claims**

Phenolic resins terminated by more than one ethylene urea group and thus having more than one unreacted >NH group are disclosed. These resins find specific utility in such fields as adhesives, insulation, encapsulation, lamination, castings, building structures and the like. When such resins are formulated so that the basic phenolic structure to which the ethylene urea groups are attached has a molecular weight between about 100 and about 5000, curing of these resins may be effected almost instantaneously by a method which comprises contacting a resin-acid catalyst system with an aldehyde. Curing by this method may be accomplished at room temperature or at temperatures slightly elevated above room temperature.

3,631,153

DIRECT ESTERIFICATION WITH FIRST STAGE ADDITIVE

Mary E. Carter, Philadelphia, and John A. Price, Swarthmore, Pa., assignors to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed Dec. 13, 1966, Ser. No. 601,350
Int. Cl. C08g *17/013*; C07c *67/00*
U.S. Cl. 260—75 R **2 Claims**

Terephthalic acid and ethylene glycol are directly esterified in the presence of an inorganic metal borate and the product of esterification is polycondensed to form a high molecular weight polyester.

3,631,154

POLYESTER POLYACRYLATE AND COMPOSITION COMPRISING THE SAME

Takeo Kawaguchi, Kishichiro Kondo, Hiroyuki Kato, Ken Maniwa, Kenji Ito, Ariyuki Hirano, Isao Thuzi, and Hidemaro Tatemichi, Nagoya, Japan, assignors to Toagasei Chemical Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Feb. 6, 1970, Ser. No. 9,415
Claims priority, application Japan, Feb. 14, 1969, 44/10,455
Int. Cl. C08f *3/62*
U.S. Cl. 260—76 **6 Claims**

Novel polyester polyacrylate monomers are prepared by the esterification reaction of glycols with acrylic or

methacrylic acid and polycarboxylic acids in the presence of esterification catalysts and polymerization inhibitors. Adhesive compositions composed of these monomers, a peroxide, a polymerization accelerator and preferably a stabilizer have a long shelf life when stored with access to oxygen, and a rapid set time when oxygen is excluded. The bonds formed with these compositions have excellent strength and resistance to alkalis.

3,631,155

POLY 1,2 - BIS(DIFLUOROAMINO)ETHYL URETHANES AND THEIR PREPARATION

Robert A. Smiley, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 28,804, May 12, 1960. This application Jan. 19, 1961, Ser. No. 83,837

Int. Cl. C08g 22/20

U.S. Cl. 260—77.5 CR 18 Claims

Polyurethanes prepared by reaction of 1,2-bis(difluoroamino)ethyl isocyanate with aliphatic polyhydric alcohols.

3,631,156

METHOD FOR PREPARING MIXED ANHYDRIDE-CONTAINING POLYMERS

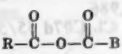
Walter L. Vaughn, Angleton, and Sherman Kottle, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 9, 1970, Ser. No. 11,364

Int. Cl. C08f 27/00

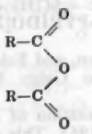
U.S. Cl. 260—78.4 D 5 Claims

A method for preparing polyalkylene copolymers which contain one or more groups of the formula



wherein R is an alkyl, aryl, aralkyl, or like group, of up to about 20 carbon atoms, and B is a segment of the polyalkylene chain, the method comprising treating an olefin-carboxylic acid copolymer, which contains at least one group of the formula

wherein B is as defined above, with an acid anhydride of the formula



wherein R is as defined above. The resulting co-polymers may be cross-linked to form insoluble films and coatings, and, further, synergistically improve the performance of textile oil- and water-proofing agents.

3,631,157

REACTIVE MIXED ANHYDRIDE-CONTAINING POLYMERS AND A METHOD FOR THEIR PREPARATION

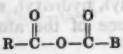
Walter L. Vaughn, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 9, 1970, Ser. No. 11,363

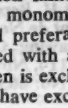
Int. Cl. C08f 27/00

U.S. Cl. 260—78.5 T 5 Claims

A composition of matter comprising polyalkylene copolymers which contain at least one acid anhydride group of the formula



wherein R is alkyl, aryl, aralkyl, or the like, of up to about 20 carbon atoms, or a group of the formula



wherein R' and R'' are the same type of substituents as R, so long as the group contains no more than about 20 total carbons, and B is a segment of the polyalkylene chain. These copolymers are prepared by treating an olefin-alkylene carboxylic acid copolymer, which contains at least one group of the formula

wherein B is as defined above, with either a carboxylic acid halide or an organic ketene. The resulting polymers may then be cross-linked to form insoluble films and coatings, and, further, synergistically improve the performance of textile oil- and water-proofing agents.

3,631,158

NEW AND USEFUL SULPHUR COMPOSITIONS AND THEIR PREPARATION

Christian Esclamadon, Billere, Yves Labat, Pau, and Jean-Baptiste Signouret, Billere, France, assignors to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

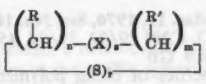
No Drawing. Filed Jan. 29, 1970, Ser. No. 6,932

Claims priority, application France, Jan. 31, 1969, 6902061

Int. Cl. C08g 23/00

U.S. Cl. 260—79 R 7 Claims

New plastic sulphur compositions are prepared by causing molten sulphur to react with one or more cyclic polysulphides of the formula:



in which *r* is 2 or 3, *z* is 0 or 1, *n* and *m* are each from 1 to 8, R and R', which may be the same or different, are each hydrogen, a monovalent hydrocarbon radical containing 1 to 12 carbon atoms, which radicals can be saturated or unsaturated aliphatic radicals, saturated or unsaturated cycloalkyl radicals, or aromatic radicals, and X is any of the following: —NH, —O—, —S—

(in which R'' can be H, CH_3 or OH)

$$—O—(CH_2)_p—O—$$

and $—S—(CH_2)_p—S—$ (p being from 1 to 6).

3,631,159

CHEMICAL PROCESS AND PRODUCT

Walter H. Cobbs, Jr., Cincinnati, Ohio, Luther A. R. Hall, Woodcliff Lake, N.J., Roger D. A. Lipman, Yonkers, N.Y., and Thomas H. Shepherd, Hopewell, N.J., assignors to Geigy Chemical Corporation

Continuation-in-part of application Ser. No. 479,416, Aug. 13, 1965. This application Sept. 21, 1966, Ser. No. 580,973

Int. Cl. C08f 15/40

U.S. Cl. 260—80.78 14 Claims

Olefin copolymers consisting of residues of at least three different alpha-olefins containing from 3 to 25 carbon atoms have utility as viscosity index improvers. The copolymers have a molecular weight between about 50,000 and about 3,000,000 and an X-ray crystallinity between about 10 and about 50%.

3,631,160

3-METHYLBUTENE-1 POLYMER FIBER

Walter J. Polestak, Summit, N.J., and Karl G. Adams, Columbia, S.C., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Nov. 2, 1966, Ser. No. 591,452
Int. Cl. C08f *15/04, 19/02;* D01d *5/12*
U.S. Cl. 260—88.2 13 Claims

Improved filaments of 3-methylbutene-1, particularly with respect to tensile properties at elevated temperatures, may be prepared by heat treating polymeric 3-methylbutene-1 prior to extrusion at a temperature above its melting point to increase the melt index above 10 and then melt spinning the heated polymer through at least a 14 mil diameter spinnerette and drawing down the resultant filament at a ratio of at least about 150.

3,631,161

METHOD FOR CROSSLINKING ETHYLENE CONTAINING POLYMERS

You-Ling Fan, East Brunswick, and Richard G. Shaw, Califon, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 737,319, June 17, 1968, and Ser. No. 831,747, June 9, 1969. This application Feb. 5, 1970, Ser. No. 9,034
Int. Cl. C08f *27/00, 3/04, 3/06*
U.S. Cl. 260—94.9 GA 6 Claims

This invention covers crosslinking ethylene containing polymers with a silyl peroxide and novel crosslinkable compositions of an ethylene containing polymer and a silyl peroxide.

3,631,162

ANTISTATIC ADDITIVE FOR OLEFIN POLYMERS

Michael C. McGaugh, Angleton, and David R. Howell, Lake Jackson, Tex., and Bruce L. Oliver, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 11, 1970, Ser. No. 18,522
Int. Cl. C08f *29/02, 29/04, 45/60*
U.S. Cl. 260—94.9 GB 7 Claims

Antistatic properties of olefin polymers are improved by a marked degree by interspersing therein a small amount of an antistatic additive comprising N-(2-hydroxy-3-dodecyloxypropyl)ethanolamine and N,N-bis(2-hydroxyethyl)alkylamine.

3,631,163

PROCESS FOR THE REMOVAL OF CATALYST RESIDUES IN A POLYOLEFIN TREATING SYSTEM

Donald R. Witt, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Feb. 23, 1967, Ser. No. 618,068
Int. Cl. C08f *27/25*
U.S. Cl. 260—94.9 GD 5 Claims

Removal of catalyst residues from polymer treated in a system utilizing a catalyst formed on mixing a Group VIII metal salt of an organic acid and a Group I–A, II–A or III–A reducing metal compound is improved by addition of a solid adsorbent material prior to the addition of the reducing metal compound.

3,631,164

WATER-SOLUBLE, BASIC AZO DYESTUFFS

Gert Hegar, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Dec. 29, 1966, Ser. No. 605,609
Claims priority, application Switzerland, Jan. 14, 1966, 483/66; Nov. 17, 1966, 16,519/66
Int. Cl. C09b *29/06;* D06p *1/02*
U.S. Cl. 260—156 12 Claims

Water-soluble basic azo-dyestuffs containing an ammonium-alkanoyl radical bound to an aminonaphthalene coupling component.

3,631,165

AZATRICYCLIC COMPOUNDS

Gilbert H. Berezin, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 775,114, Nov. 12, 1968. This application Aug. 21, 1970, Ser. No. 66,098
Int. Cl. C07d *41/04, 41/06*
U.S. Cl. 260—239 B 2 Claims

This invention relates to the novel compounds 4-azatricyclo[4.3.1.$1^{3,8}$]undecane and 4-azatricyclo[5.3.1.$1^{3,9}$]dodecane, the methods of preparing same and the use thereof as intermediates in the preparation of pharmaceutically active derivatives thereof.

3,631,166

NITROGEN CONTAINING STEROIDS

Milton Heller and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 16, 1970, Ser. No. 20,122
Int. Cl. C07c *173/10*
U.S. Cl. 260—239.5 8 Claims

The preparation of androst-5-ene(16β,17β-b)azetidinium steroids and derivatives thereof from dimethylaminopregnenes is described. These steroids are useful as antibacterial agents and as tranquilizers.

3,631,167

3-INDENYLMETHYLTETRAZOLES

Tsung-Ying Shen, Westfield, and Conrad P. Dorn, Jr., Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation of application Ser. No. 692,296, Dec. 21, 1967. This application July 16, 1970, Ser. No. 56,986
Int. Cl. C07d *55/56*
U.S. Cl. 260—240 D 6 Claims

This invention relates to the preparation of 3-indenylmethyltetrazoles and intermediates thereof. The compounds of this invention are useful as anti-inflammatory agents and may be used in the treatment of diseases which are susceptible to such agents.

3,631,168

TETRAHYDRO-PYRROLO[2,1-b]OXAZOLE - 5(6H)-ONES, HEXAHYDRO - 5H - OXAZOLO[3,2-a]PYRIDINE-5-ONES, TETRAHYDRO - 2H - PYRROLO [2,1-b]1,3 OXAZINE - 6(7H) - ONES AND HEXAHYDRO - 2H, 6H-PYRIDO[2,1-b]1,3 OXAZINE-6-ONES

Wilfried Graf, Binningen, and Erich Schmid, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Continuation of application Ser. No. 429,892, Feb. 2, 1965. This application Mar. 20, 1967, Ser. No. 624,631
Claims priority, application Switzerland, Feb. 11, 1964, 1,631/64
Int. Cl. C07d *87/06*
U.S. Cl. 260—244 17 Claims

This invention relates to compounds of the formula:

wherein

R is a member selected from the group consisting of (a) thienyl-(2) and (b) phenyl which is substituted by a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl amino, N-lower alkyl-substituted amino, lower alkanoylamino, sulfamyl, N-lower alkyl-substituted sulfamyl, hydroxyl, nitro, trifluoromethyl and halogen of one of the atomic numbers 9, 17 and 35,

A represents straight-chain alkylene of from 2 to 3 carbon atoms substituted by a member selected from the group consisting of hydrogen, lower alkyl and phenyl, and

B represents straight-chain alkylene of from 2 to 3 carbon atoms substituted by a member selected from the group consisting of hydrogen and lower alkyl.

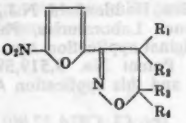
These compounds have anti-inflammatory, anesthesia-potentiating, anti-convulsive and analgetic activity.

3,631,169
3-(5-NITRO-2-FURYL)ISOXAZOLINE DERIVATIVES

Shinsaku Minami, Yamato Kouriyama-shi, Jun-Ichi Matsumoto, Osaka, Masanao Shimizu, Kobe, and Yoshiyuki Takase, Amagasaki-shi, Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

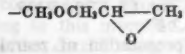
No Drawing. Filed Sept. 22, 1966, Ser. No. 581,192
Int. Cl. C07d *85/16, 99/02*
U.S. Cl. 260—247.5 R **35 Claims**

3-(5-nitro-2-furyl) isoxazoline derivatives having antibacterial and antiprotozoal activities of the formula:



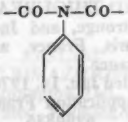
wherein R_1 represents a member selected from the groups consisting of hydrogen, benzyl, lower alkyl and lower alkoxycarbonyl; R_2 represents hydrogen or a lower alkyl group; R_3 represents a member selected from the group consisting of hydrogen,

(wherein R′ and R″ represent lower alkyl and R′ and R″ together with the nitrogen atom may form a heterocyclic ring selected from pyrrolidino, piperidino and morpholino), lower alkyl and lower alkoxy; R_4 represents a member selected from the groups consisting of hydrogen, lower alkyl, lower alkanoyl, phenyl, cyanomethyl, chloromethyl, pyridine, methyl pyridine, lower alkoxycarbonyl and



R_1 and R_4 together may form a bridge selected from the groups consisting of $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_3O—$

and

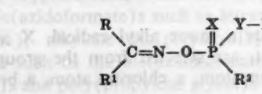


3,631,170
CERTAIN OXIMINO PHOSPHORUS CONTAINING PYRIMIDINES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Apr. 6, 1970, Ser. No. 26,150
Int. Cl. C07d *51/36*
U.S. Cl. 260—256.5 R **2 Claims**

Compound having the formula:



in which X is oxygen or sulfur; Y is oxygen or sulfur; R is alkyl; R^1 is alkyl; R^2 is alkyl or alkoxy and R^3 is a heterocyclic group, and their use as insecticides and acaricides are disclosed.

3,631,171
CERTAIN 2-AMINO-4,5-DIHYDRO-6H-PYRROLO [3,2-e]BENZOTHIAZOLES

William Alan Remers, Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 6, 1970, Ser. No. 1,040
Int. Cl. C07d *99/06*
U.S. Cl. 260—268 TR **10 Claims**

This disclosure describes compounds of the class of 2-substituted-4,5-dihydro-6H-pyrrolo[3,2-e]benzothiazoles useful as antifungal agents.

3,631,172
CERTAIN BI[SPIRO(2H-1-BENZOPYRAN-2,2′-BENZOTHIAZOLINE)] COMPOUNDS

René Lucien Gautron, Sceaux, Seine, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

No Drawing. Filed June 7, 1966, Ser. No. 555,676
Claims priority, application France, June 11, 1965, 20,408
Int. Cl. C07d *91/24*
U.S. Cl. 260—304 **4 Claims**

Photochromic compounds which are useful to change color upon exposure to radiation, comprising di-spiropyrans of the formula

in which, E represents a heterocyclic system having weak or zero absorption in the visible spectrum, D and D′ represent mono or polycyclic aromatic or heterocyclic systems capable of combining with substituents X and Y, and X and Y are chosen from H—, CH_3—, C_2H_5—, C_6H_5—, CHO—, CH_3CO—, CH_3O—, NO_2—, CN—, CH_3COO—, CF_3— and halogens, and R represents aromatic, aliphatic, or aryl-aliphatic radicals, and methods of producing the compounds and devices using the compounds.

3,631,173
2 - AMINOTHIENO[3,2-e]BENZOTHIAZOLE AND CERTAIN 4,5-DIHYDRO DERIVATIVES THEREOF

William Alan Remers, Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 6, 1970, Ser. No. 1,044
Int. Cl. C07d *99/06*
U.S. Cl. 260—305 **10 Claims**

This disclosure describes compounds of the class of 2 - substituted - 4,5 - dihydrothieno[3,2-e]benzothiazoles useful as analgesics, anti-inflammatory agents or central nervous system depressants.

3,631,174
4,5-HETEROCYCLIC SUBSTITUTED-6,7-DIHYDROBENZOTHIOPHENES

William Alan Remers, Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 6, 1970, Ser. No. 1,039
Int. Cl. C07d *49/02, 85/48*
U.S. Cl. 260—307 D **2 Claims**

This disclosure describes compounds of the class of 4,5 - heterocyclic substituted-6,7-dihydrobenzothiophenes

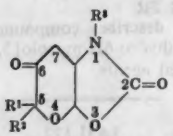
useful as an analgesic agent or central nervous system depressant.

3,631,175
DERIVATIVES OF PYRANO[3,2-d]OXAZOLE

Real Laliberte, Laval, Quebec, Canada, assignor to Ayerst, McKenna and Harrison Limited, Ville St. Laurent, Quebec, Canada

No Drawing. Filed Apr. 14, 1970, Ser. No. 28,540
Int. Cl. C07d *85/28*
U.S. Cl. 260—307 17 Claims

Pyrano[3,2-d]oxazole derivatives of the formula



(I)

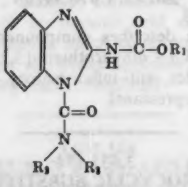
in which R^1 represents an aromatic group such as phenyl, benzyloxyphenyl, 3,4-xylyl, α-hydroxybenzyl, diphenylmethyl, 4-biphenylyl and 4'-chloro-4-diphenylyl; R^2 represents hydrogen, lower alkyl, chloromethyl, phenyl, and benzyl; or R^1 or R^2 together represent the cyclohexane ring attached in spiral fashion to the pyranone ring in such a manner that carbon atom 5 of the pyrano ring is common to the cyclohexane ring; and R^3 is lower alkyl, phenyl or 4-chlorophenyl. The compounds are useful as fungicidal and amebicidal agents, and methods for their use and a process for preparing them and intermediates used in their syntheses are also disclosed. The compounds of Formula I are useful as fungicidal and amebicidal agents, and the intermediates of Formula III are useful as coccidiostatic agents. Methods for their use, and a process for preparing the compounds of Formula I and intermediates used in their syntheses are also disclosed.

3,631,176
CARBAMOYL SUBSTITUTED 2-AMINO-BENZIMIDAZOLES

Hein L. Klopping, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Application Mar. 20, 1968, Ser. No. 714,462, now Patent No. 3,541,213, which is a continuation-in-part of application Ser. No. 629,900, Apr. 11, 1967, which in turn is a continuation-in-part of application Ser. No. 548,034, May 6, 1966. Divided and this application July 20, 1970, Ser. No. 56,716
Int. Cl. C07d *49/38*
U.S. Cl. 260—309.2 5 Claims

Carbamoyl substituted 2-aminobenzimidazoles of the formula below are useful as mite ovicides and fungicides.



where R_1, R_2 and R_3 are as defined hereinafter. Exemplary species of the general class are the compounds:

methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate,
methyl 1-(p-methoxyphenylcarbamoyl)-2-benzimidazolecarbamate,
methyl 1-(ethoxycarbonylmethylcarbamoyl)-2-benzimidazolecarbamate, and the like.

3,631,177
3-PHENACYL-2-OXOINDOLINES

Kenneth G. Holden, Haddonfield, N.J., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Apr. 18, 1967, Ser. No. 631,619, now Patent No. 3,519,592, dated July 7, 1970. Divided and this application Apr. 21, 1970, Ser. No. 30,578
Int. Cl. C07d *27/40*
U.S. Cl. 260—325 8 Claims

3 - phenacylidene - 2 - oxoindoline - 7 - carboxylic acids and esters, prepared by converting 2,3-dioxoindoline-7 - carboxylic acids to 3 - hydroxy - 3 - phenacyl - 2 - oxo compounds and subsequent dehydration. The 3 - phenacylidene compounds are reduced to the 3-phenacyl compounds and then ring-closed with hydrazine to give 3-phenylpyridazinoindoles. 2 - oxoindoline - 7 - carboxylic acids are prepared by stepwise reduction of the 2,3-dioxo compounds. Certain of the compounds have antiinflammatory activity.

3,631,178
2-OXOINDOLINES

Kenneth G. Holden, Haddonfield, N.J., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Apr. 18, 1967, Ser. No. 631,619, now Patent No. 3,519,592, dated July 7, 1970. Divided and this application Apr. 21, 1970, Ser. No. 30,580
Int. Cl. C07d *27/40*
U.S. Cl. 260—325 4 Claims

3-phenacylidene - 2 - oxoindoline - 7 - carboxylic acids and esters, prepared by converting 2,3-dioxoindoline-7-carboxylic acids to 3-hydroxy-3 phenacyl-2-oxo compounds and subsequent dehydration. The 3-phenacylidene compounds are reduced to the 3-phenacyl compounds and then ring-closed with hydrazine to give 3-pehnylpyridazinoindoles, 2-oxoindoline-7-carboxylic acids are prepared by stepwise reduction of the 2-3-dioxo compounds. Certain of the compounds have antiinflammatory activity.

3,631,179
ZEARALANE PRODUCTION

Wilbert H. Urry, Chicago, Ill., assignor to Commercial Solvents Corporation, New York, N.Y.

No Drawing. Filed Dec. 13, 1966, Ser. No. 601,339
Int. Cl. C70d *9/00*
U.S. Cl. 260—343.2 F 2 Claims

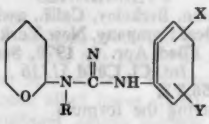
Disclosed is a preparation of zearalane from 10-undecanal.

3,631,180
NEW UREA AND THIOUREA DERIVATIVES

Daniel Bertin, Montrouge, and Jacques Perronnet and Andre Teche, Paris, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Jan. 14, 1970, Ser. No. 2,975
Claims priority, application France, Jan. 20, 1969, 6900886
Int. Cl. C07d *7/04*
U.S. Cl. 260—345.1 21 Claims

Urea and thiourea derivatives of Formula I:



(I)

wherein R represents a lower alkyl radical, X and Y, identical or different, are selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine

atom, a nitro radical, a trifluoromethyl radical, a lower alkyloxy radical, a lower alkyl radical, a lower alkenyloxy radical, a halogen-substituted lower alkenyloxy radical, a lower alkyloxycarbonyl radical, a lower alkylthio radical, a lower alkylsulfinyl radical and a lower alkylsulfonyl radical, and Z is selected from the group consisting of an oxygen atom and a sulfur atom, process for their preparation, compositions containing them, and pesticidal method. The derivatives of Formula I possess pesticidal, particularly herbicidal properties.

3,631,181

PREPARATION OF NITROALKYLTETRAHYDROFURANS

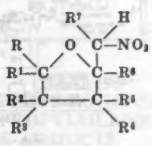
John M. Larkin, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 708,752, Feb. 28, 1968. This application July 13, 1970, Ser. No. 54,581

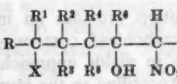
Int. Cl. C07d *5/04*

U.S. Cl. 260—346.1 23 Claims

A method of preparing a nitroalkyltetrahydrofuran corresponding to the formula:



by contacting a halonitroalcohol having at least 5 carbon atoms corresponding to the formula:



with an alkaline agent at a temperature of from about 0 to 250° C. The contemplated nitroalkyltetrahydrofurans prepared according to this invention are useful as insecticides, nematocides, coccidiostats, solvents, plasticizers, rust inhibitors, lubricant additives and fuel additives. The method of this invention also provides as valuable by-products haloketones and nitroalkanes.

3,631,182

ALIPHATIC BIS(AZIDOFORMATE)S

David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 418,278, Dec. 14, 1964, which is a continuation-in-part of applications Ser. No. 172,815, Feb. 12, 1962, now Patent No. 3,211,752, and Ser. No. 247,878, Dec. 28, 1962. This application May 21, 1970, Ser. No. 39,521

Int. Cl. C07d *109/00*

U.S. Cl. 260—349 11 Claims

Aliphatic compounds containing from 2 to 4 azidoformate groups are described, which compounds are useful for cross-linking various polymers, particularly polyolefins. Typical compounds are alkylene bis-, tris- and tetrakis(azidoformate)s such as tetramethylene bis(azidoformate), alkylene bis(polyoxyalkylene) bis(azidoformate)s such as the bis(azidoformate)s of poly(ethylene glycol)s and poly(propylene glycol)s.

3,631,183

CYCLOALIPHATIC BIS(AZIDOFORMATE)S

David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 418,278, Dec. 14, 1964, which is a continuation-in-part of applications Ser. No. 172,815, Feb. 12, 1962, and Ser. No. 247,878, Dec. 28, 1962. This application May 21, 1970, Ser. No. 39,522

Int. Cl. C07c *117/00*

U.S. Cl. 260—349 6 Claims

Cyclohexane bis(azidoformate)s and cyclohexane bis(methylene azidoformate)s are described. These products are useful as cross-linking agents for various polymers, particularly polyolefins.

3,631,184

WATER-INSOLUBLE ANTHRAQUINONE DYESTUFFS

Jean-Frederic GuyeVuilleme, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed June 17, 1966, Ser. No. 558,245

Claims priority, application Switzerland, July 1, 1965, 9,226/65; May 16, 1966, 7,099/66

Int. Cl. C09b *1/50*

U.S. Cl. 260—380 2 Claims

New water-insoluble anthraquinone dyestuffs containing dihydroxy, diamino and an aryl substituent, said dyestuff containing at least one halo substituent on the anthraquinone and/or aryl moiety.

3,631,185

SYNTHESIS OF 2,4,6-TRI-t-BUTYL-4-METHOXYCYCLOHEXA-2,5-DIEN-1-ONE

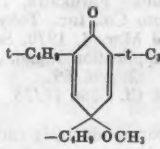
Robert J. Laufer, Colts Neck, N.J., assignor to Consolidation Coal Company, Pittsburgh, Pa.

No Drawing. Filed Apr. 10, 1970, Ser. No. 27,456

Int. Cl. C07c *49/44*

U.S. Cl. 260—396 N 6 Claims

The compound 2,4,6-tri-t-butyl-4-methoxycyclohexa-2,5-dien-1-one, having the following structural formula



is synthesized in one step by reacting 2,4,6-tri-t-butylphenol, bromine, methanol and an alkali metal carbonate at a temperature within the range 20 to 80° C. The product compound having the above formula is produced in 65 percent or better yield. It is useful as an intermediate in the preparation of 2,6-di-t-butyl-4-methoxyphenol or 2-t-butyl-4-methoxyphenol, both of which are useful as antioxidants, the former in non-food uses and the latter in foods.

3,631,186

17β-DIALKYLAMINOALKYLAMINO - 5α-ANDROSTAN-1-ONES/1α-OLS, N-FORMYL AND Δ^2 DERIVATIVES THEREOF AND INTERMEDIATES THERETO

Paul D. Klimstra, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Apr. 27, 1970, Ser. No. 32,388

Int. Cl. C07c *169/20, 169/22*

U.S. Cl. 260—397.3 10 Claims

Manufacture of the instant diamines is achieved by condensation of the appropriate 17-keto steroid with a

dialkylaminoalkylamine and reduction of the resulting imines. Formylation, suitably with formic anhydride, of those diamines yields the corresponding formamides. These novel diamines and formamides display valuable pharmacological properties, e.g. anti-ulcerogenic, antibacterial, anti-fungal and anti-algal.

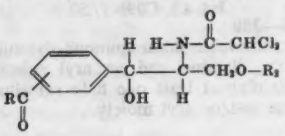
3,631,187

WATER-SOLUBLE DERIVATIVES OF ACYL-PHENYLACYLAMIDO-1,3-PROPANEDIOLS

Maximilian von Strandtmann, Rockaway Township, John Shavel, Jr., Mendham, and George Bobowski, East Orange, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed Apr. 26, 1965, Ser. No. 451,008
The portion of the term of the patent subsequent to May 11, 1982, has been disclaimed
Int. Cl. C07c *69/34*
U.S. Cl. 260—404 3 Claims

The invention discloses certain water soluble 1,3-substituted propanediols of the formula:



(L)

wherein R is alkyl or aryl R_2 is a member selected from the group consisting of palmitoyl, palmitoyloxyacetate and hemisuccinoyl. These derivatives are useful as antimicrobial agents.

3,631,188

PRODUCTION OF ALDEHYDE CARBOXYLIC ACID OR ALDEHYDE AND CARBOXYLIC ACID

Hachiro Wakamatsu, Tokyo, Nobuyuki Yamagami, Kawasaki, and Jyunko Furukawa, Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,590
Claims priority, application Japan, Apr. 7, 1969, 26,696/69
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 8 Claims

A process for preparing aldehyde carboxylic acid or a mixture of an aldehyde and a carboxylic acid by heating an intramolecular or intermolecular carboxylic acid anhydride with synthesis gas under pressure in the presence of a cobalt carbonyl catalyst. A solvent which is strongly nucleophilic towards the catalyst may optionally be present during the reaction. A tertiary amine or a halide salt may be added to the reaction mixture to repress decomposition of the catalyst.

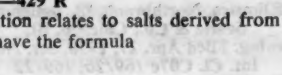
3,631,189

SALTS CONTAINING 2-p-DIOXANONE AND METHOD OF PREPARING SAME

Thomas C. Snapp and Alden E. Blood, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 1, 1970, Ser. No. 24,878
Int. Cl. C07f *13/00, 15/04, 3/00*
U.S. Cl. 260—429 R 6 Claims

This invention relates to salts derived from 2-p-dioxanone which have the formula



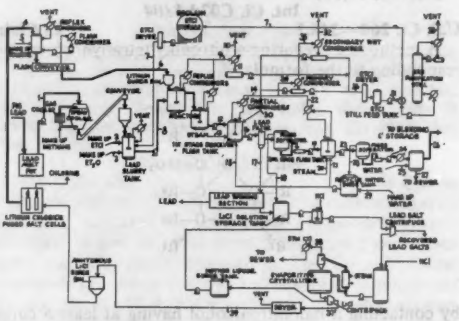
wherein M is a divalent inorganic cation, e.g. calcium or copper. These salts have unexpectedly been found to function as useful stabilizers for plastic compositions such as halogen-containing resins, e.g. polyvinyl chloride.

3,631,190

PROCESS FOR PRODUCING HYDROCARBONLEADS

Henry V. Cortez, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 783,387, Dec. 12, 1968, which is a continuation-in-part of applications Ser. No. 593,845 and Ser. No. 593,747, both Nov. 14, 1966. This application Apr. 28, 1970, Ser. No. 32,705
Int. Cl. C07f *7/24*
U.S. Cl. 260—437 R 53 Claims



The instant invention provides an improved process whereby tetrahydrocarbonlead compounds are produced from metallic leads in yields approaching 100 percent based on the lead. According to the invention, hydrocarbonlead compounds are produced from metallic lead and hydrocarbon halides in the presence of metallic lithium. The reaction may be represented by the generic expression:

(4) $$Pb+4Li+4RX \rightarrow Pb(R)_4+4LiX$$

wherein RX represents a hydrocarbon halide in which X represents chlorine, bromine and/or iodine and R represents an unsubstituted alkyl, alkenyl and/or aryl group. The specific reactions of most interest are those in which the hydrocarbon constituents of the reactants and the product contain 1 through 6 carbon atoms. Reactions in which these hydrocarbon constituents contain more than 6 carbon atoms are within contemplation but are of relatively little present day commercial interest.

3,631,191

SYNTHESIS OF ZERO VALENT NICKEL-TETRAKIS TRIARYL PHOSPHITE COMPLEXES

Neal James Kane, Springfield, Pa., and John Brockway Thompson, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 8, 1970, Ser. No. 26,770
Int. Cl. C07f *15/04*
U.S. Cl. 260—439 R 8 Claims

The process for preparing a zero valent nickel-phosphite complex by reacting a divalent nickel com-

pound with a reducing metal in the presence of a triaryl phosphite in a saturated aliphatic dinitrile solvent. The reaction mixture separates into multiple phases, one of which contains the desired complex substantially free of by-product and another phase containing the by-product of the reducing action.

3,631,192
HYDROSILYLALKYL ALUMINUMS
Keith W. Michael, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed Feb. 13, 1970, Ser. No. 11,327
Int. Cl. C07g 5/06
U.S. Cl. 260—448 A **1 Claim**

Compounds of the formula

$$R_xAl\{C_2H_4(R')_ySiR''_aH_{2-a}\}_{3-x}$$

are prepared by reacting trialkyl aluminum compounds with $CH_2{=}CH(R')_ySiR''_aH_{3-a}$ in an inert atmosphere at a temperature of from 100 to 150° C. For example, triisobutyl aluminum is reacted with vinylmethylsilane in helium at 120° C. to give $(iC_4H_9)_2AlC_2H_4Si(CH_3)H_2$. The compounds are useful as intermediates in the preparation of carboxyalkyl silicon compounds and alkenylsilanes and can be used as water repellants.

3,631,193
TRIS(DIMETHYLHYDROGENSILOXY) - 3,3,3-TRIFLUOROPROPYLSILANE VINYLTRIACETOXYSILANE ADDUCTS
Donald G. Young, Glendale, Ky., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed Apr. 20, 1970, Ser. No. 30,345
Int. Cl. C07f 7/02; C23c 11/06
U.S. Cl. 260—448.2 R **4 Claims**

Adducts of tris(dimethylhydrogensiloxy) - 3,3,3 - trifluoropropylsilane with vinyltriacetoxysilane are useful in preparing primers to adhere poly-3,3,3-trifluoropropylmethylsiloxane based elastomers to epoxy resins and polyurethane and a primer to adhere poly-3,3,3-trifluoropropylmethylsiloxane based elastomers to titanium. Illustrative of the adducts is

$$CF_3CH_2CH_2Si\begin{matrix}[OSi(CH_3)_2H]_3\\|\\OSi(CH_3)_2CH_2CH_2Si(O\overset{O}{\overset{\|}{C}}CH_3)_3\end{matrix}$$

3,631,194
METHOD OF PREPARING MERCAPTOALKYL ALKOXY SILANES
Gary E. Le Grow, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 847,407, Aug. 4, 1969. This application Apr. 23, 1970, Ser. No. 31,348
Int. Cl. C07f 7/02, 7/04
U.S. Cl. 260—448.2 E **9 Claims**

Isothiuronium salts of the formula

$$Cl^-(NH_2)_2{+}CSR'''SiR'_x(OR)_{3-x}$$

where R''' is —CH_2— or —CH_2CH_2—, are reacted with ammonia in monohydric alcohol solvent under anhydrous conditions to give excellent yields of $HSR'''SiR_x(OR)_{3-x}$. The latter are used as coupling agents between siliceous substrates and diene resins. For example,

$$Cl^-(NH_2)_2{+}CSCH_2Si(OCH_3)_3$$

in methanol gives $HSCH_2Si(OCH_3)_3$.

3,631,195
METHOD OF PRODUCING TETRASILA-ADAMANTANES
Cecil L. Frey and Donald R. Weyenberg, Midland, and Jerome M. Klosowski, Bay City, Mich., assignors to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed May 18, 1970, Ser. No. 38,496
Int. Cl. C07d 103/02
U.S. Cl. 260—448.2 E **6 Claims**

Tetrasila-adamantane compounds are produced by aluminum halide catalyzed rearrangement of silmethylene compounds. The compounds are useful as mosquito repellents.

3,631,196
OXYGEN-CONTAINING TETRASILA-ADAMANTANE COMPOUNDS
Jerome M. Klosowski, Bay City, Mich., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed May 18, 1970, Ser. No. 38,497
Int. Cl. C07d 103/02
U.S. Cl. 260—448.2 D **13 Claims**

Tetrasila-adamantane compounds, in which one of the methylene linkages is replaced with an oxygen linkage and in which at least one of the silicon atoms contains a methyl substituent, are useful as mosquito repellents.

3,631,197
PRODUCTION OF TETRASILA-ADAMANTANE COMPOUNDS
Jerome M. Klosowski, Bay City, and Arthur J. Barry, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed May 18, 1970, Ser. No. 38,498
Int. Cl. C07d 103/02
U.S. Cl. 260—448.2 E **8 Claims**

Tetrasila-adamantane compounds are produced by the high temperature (400° C.) and high pressure (1500 p.s.i.) reaction of methylhalosilanes in the presence of aluminum chloride or aluminum bromide as a catalyst and silicon or aluminum metal as an acid acceptor. The compounds are useful as mosquito repellents.

3,631,198
PREPARATION OF 1,5-DIISOCYANATO-2-METHYLPENTANE
David Horvitz and Robert J. Shaw, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.
No Drawing. Filed Sept. 7, 1966, Ser. No. 577,597
Int. Cl. C07c 119/04
U.S. Cl. 260—453 PH **5 Claims**

A process is provided for the preparation of 1,5-diisocyanato - 2 - methylpentane from 1,5-diamino-2-methylpentane, its hydrochloride, carbamate or carbamyl chloride salt thereof, by reaction with phosgene in solution in a lower alkyl ester of phthalic acid as the solvent for the reaction.

3,631,199
POLYETHER DIISOCYANATES
Samuel Smith, Roseville, and Allen J. Hubin, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Continuation-in-part of application Ser. No. 527,399, Feb. 10, 1966, which is a continuation-in-part of application Ser. No. 290,218, June 24, 1963. This application Mar. 20, 1967, Ser. No. 624,197
Int. Cl. C07c 119/04; C08a 22/20, 22/44
U.S. Cl. 260—453 AL **7 Claims**

A polyether diisocyante having the formula

$$OCN(RO)_nRNCO$$

in which at least 60 percent of said R radicals are tetramethylene, the remainder being another alkylene radical having from 2 to 6 carbon atoms and *n* is an integer from about 3 to about 3000. These polyether diisocyanates may be used in chain extension and curing reactions with coreactants containing active hydrogen, and elastomers having high tensile strength and elongation can be produced.

3,631,200

PROCESS FOR THE PREPARATION OF CARBONATE-GROUP-CONTAINING DIHYDROXY COMPOUNDS

Rudolf Nehring and Wolfgang Seeliger, Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

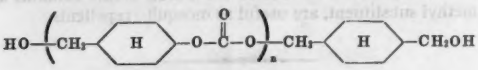
No Drawing. Filed Jan. 19, 1967, Ser. No. 610,230

Claims priority, application Germany, Feb. 11, 1966, C 38,191; Sept. 24, 1966, C 40,188, C 40,189

Int. Cl. C07c *69/00*

U.S. Cl. 260—463 **5 Claims**

Process for the preparation of a diol containing carbonate groups, having the general formula:



in which the average value of *n* ranges from 1 to 32 which consists in completely reacting at 1,4-bis-(hydroxymethyl)-cyclohexane with phosgene at a molar ratio ranging from 1:0.5 to 1:0.97, in the presence of an inert diluent in which are soluble both the starting products and the final products, under normal pressure and at a reaction temperature not higher than 75° C., and upon conclusion of the reaction distilling off the solvent while passing an inert gas through the reaction mixture thereby removing HCl in free form.

3,631,201

1,2-DI(4-CYANOMETHYLPHENYL)-1-CYANOETHANE

William J. Farrissey, Jr., Northford, and Edward J. Thompson, Watertown, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original application Jan. 15, 1968, Ser. No. 697,652, now Patent No. 3,539,611, dated Nov. 10, 1970. Divided and this application May 8, 1970, Ser. No. 35,878

Int. Cl. C07c *87/28, 119/04, 121/66*

U.S. Cl. 260—465 H **1 Claim**

A triisocyanate, 1,2-di[4 - (2-isocyanatoethyl)phenyl]-3-isocyanatopropane, is prepared by phosgenation of the corresponding triamine. The latter is prepared by catalytic hydrogenation of the corresponding trinitrile. The latter is obtained by reaction of α,α′-dihalo-p-xylene with sodium cyanide. The triisocyanate is an intermediate in the preparation of polyurethanes; the triamine is a curative for epoxy resins.

3,631,202

PREPARATION OF NITRILES

Lawrence C. Mitchell, Southfield, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 712,944, Mar. 14, 1968. This application Aug. 20, 1970, Ser. No. 65,722

Int. Cl. C07c *121/16*

U.S. Cl. 260—465.1 **8 Claims**

Alkyl nitriles are produced by the reaction of aluminum tris-alkoxides with alkali metal cyanides. For example, hexyl cyanide is prepared from aluminum tris-hexyloxide and sodium cyanide. The process is conducted in the presence of an aprotic dipolar solvent at comparatively high temperatures and for comparatively long reaction times. The reaction is catalyzed by aluminum chloride.

3,631,203

PREPARATION OF MONO-ESTERS OF HYDROQUINONES

Donald A. Bolon, Scotia, N.Y., assignor to General Electric Company

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,114

Int. Cl. C07c *69/16, 69/28, 69/78*

U.S. Cl. 260—476 R **10 Claims**

Mono-esters of hydroquinones are prepared from the 4-halophenol corresponding to the desired hydroquinone by oxidatively removing the halogen with selected oxidizing agents in the presence of the carboxylic acid whose monoester of the hydroquinone is desired. The products are useful as anti-oxidants, polymerization inhibitors, precursors of photographic developers, etc.

3,631,204

PREPARATION OF BENZOIC ACID FROM TOLUENE

Clyde H. Bell, Chattanooga, Tenn., assignor to Velsicol Chemical Corporation, Chattanooga, Tenn.

No Drawing. Filed Apr. 13, 1967, Ser. No. 630,494

Int. Cl. C07c *63/02*

U.S. Cl. 260—524 R **10 Claims**

An improvement in the process for the production of benzoic acid by the reaction of toluene and air in contact with a heavy metal oxidation catalyst which comprises

performing the oxidation in a liquid system at a temperature of at least about 200° F. until the reaction mixture contains from about 40 to about 65 weight percent benzoic acid;

reducing the pressure on the reaction mixture to atmospheric while maintaining the reaction mixture in the liquid state;

maintaining the concentration of the benzoic acid in the reaction mixture to between about 25 and about 45 weight percent;

and further lowering the temperature of the reaction mixture to a temperature below about 100° F.

3,631,205

SULFONYL UREA DERIVATIVES

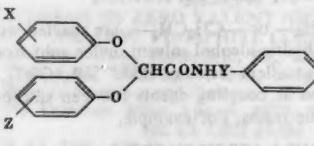
Albert J. Frey, Essex Fells, N.J., assignor to Sandoz Inc., Hanover, N.J.

No Drawing. Filed Dec. 15, 1966, Ser. No. 601,871

Int. Cl. C07c *127/00*

U.S. Cl. 260—553 DA **5 Claims**

The compounds are derivatives of benzenesulfonyl urea having the structural formula



and the non-toxic basic salts thereof,

wherein

X and Z are each, independently, hydrogen or halo;
Y represents alkylene having from 1 to 3 carbon atoms;
R' represents hydrogen, lower alkyl, lower alkenyl, lower alkylthio, cycloalkyl having from 5 to 8 ring carbon atoms, lower alkylcycloalkyl having from 5 to 8 ring carbon atoms, benzyl, phenyl (lower) alkyl, lower alkylphenyl or cycloalkyl (lower) alkyl having from 5 to 8 ring carbon atoms.

The compounds are useful as hypoglycemic agents, e.g., 1-[p-{2-[α,α-bis(p-chlorophenoxy)acetamido]ethyl} phenylsulfonyl]-3-cyclohexylurea.

3,631,206

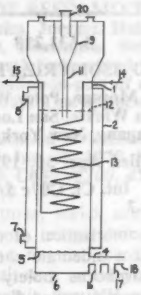
CONTROL OF OXYCHLORINATION REACTIONS

Lester E. Bohl and Raymond M. Vancamp, New Martinsville, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of application Ser. No. 219,334, Aug. 24, 1962. This application June 1, 1966, Ser. No. 554,475

Int. Cl. C07c *21/04*

U.S. Cl. 260—654 A **7 Claims**



The undesirable burning of organics in a fluidized bed of catalyst particles during an oxychlorination reaction is reduced and the rate of heat transfer is increased by employing two cooling surfaces in contact with the reaction zone. The first cooling surface is maintained at temperatures considerably below those necessary to maintain the oxychlorination taking place within the bed. The temperature of the second cooling surface is higher than that of the first surface and is at least in part at the threshold temperature necessary for the oxychlorination reaction being conducted.

3,631,207

TRI- AND TETRACHLOROETHYLENE PROCESS

Charles E. Kircher, Jr., Detroit, Donald R. McAlister, Livonia, and Doris LeRoy Brothers, Inkster, Mich., assignors to Detrex Chemical Industries, Inc., Detroit, Mich.

No Drawing. Filed July 14, 1966, Ser. No. 565,095

Int. Cl. C07c *21/04*

U.S. Cl. 260—654 D **11 Claims**

Processes are disclosed for producing trichloroethylene, tetrachloroethylene or mixtures thereof by dehydrochlorination of polychlorinated saturated ethanes or mixtures thereof while in the liquid state under positive pressure and elevated temperatures and in the presence of activated carbon. The reaction products are removed from the reaction zone as vapors.

3,631,208

COUPLING OF PHENOLS WITH DIPHENOQUINONES

Allan S. Hay, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Continuation-in-part of abandoned applications Ser. No. 306,301 and Ser. No. 306,302, both Sept. 3, 1963. This application June 10, 1966, Ser. No. 556,575

Int. Cl. C07c *43/20, 43/22, 39/12*

U.S. Cl. 260—619 R **21 Claims**

Binary self-condensation products of phenols are prepared by reacting them with diphenoquinones in the liquid phase. Since the diphenoquinones themselves can be prepared from phenols, the phenols need to be the only starting material to produce the self-condensation products. By using 2,6-disubstituted phenols and the corresponding diphenoquinones prepared from the particular 2,6-disubstituted phenol, the self-condensation product of the phenol is a 2,2',6,6'-p,p'-biphenol and is produced both from the phenol and diphenoquinone reaction. Since 2,6-disubstituted phenols may be made by alkylation of either phenol or 2-substituted phenols and the biphenol product may be readily dealkylated, biphenols can be made which have from 0 to 4 substituents in the 2,2',6 and 6' positions.

3,631,209

PREPARATION OF CYCLOOLEFINS

Kenneth J. Frech, Tallmadge, and David A. Hutchings and Frederic H. Hoppstock, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed June 22, 1970, Ser. No. 48,461

Int. Cl. C07c *5/20*

U.S. Cl. 260—666 A **8 Claims**

There is disclosed a method comprising the preparation of cyclic olefins and cyclic diolefins characterized in that open chain diolefins are heated in the process of a homogeneous catalyst.

3,631,210

PROCESS FOR THE SELECTIVE HYDROGENATION OF CYCLODODECATRIENE TO CYCLODODECENE

Michael Tuttle Musser, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 7, 1970, Ser. No. 62,204

Int. Cl. C07c *5/14, 5/16*

U.S. Cl. 260—666 A **6 Claims**

An improved process for the selective hydrogenation of 1,5,9-cyclododecatriene to cyclododecene in the presence of a nickel halide complexed with a trihydrocarbyl phosphine which comprises carrying out the hydrogenation with at least a 2 molar excess of the phosphine and at a hydrogen pressure in the order of 65–150 atmospheres.

3,631,211

PREPARATION OF GEM-DIARYLALKANES

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,354

Int. Cl. C07c *15/12*

U.S. Cl. 260—668 C **11 Claims**

Gem-diarylalkanes are prepared by reacting an arylalkane with an alkyl-free aromatic hydrocarbon in the presence of a catalyst comprising a Friedel-Crafts metal halide and a higher valence halide of a metal which possesses at least two valences.

3,631,212

PREPARATION OF POLYARYLPOLYALKANES

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,355

Int. Cl. C07c *15/12*

U.S. Cl. 260—668 C 10 Claims

Polyarylpolyalkanes are prepared by polymerizing an arylalkane in the presence of a catalyst comprising a Friedel-Crafts metal halide and a higher valence halide of metal which possesses at least two valences.

3,631,213

PROCESS FOR THE PREPARATION OF META- AND PARA-TERTIARYBUTYLSTYRENES

Charles C. Brewer, Baton Rouge, La., assignor to Foster Grant Co., Inc., Leominster, Mass.

No Drawing. Continuation-in-part of application Ser. No. 730,901, May 21, 1968. This application May 7, 1970, Ser. No. 35,595

Int. Cl. C07c *15/10*

U.S. Cl. 260—669 10 Claims

This disclosure relates to a process for the production of tertiarybutylstyrenes by catalytic dehydrogenation of tertiarybutylethylbenzene.

3,631,214

RECOVERY OF AROMATIC HYDROCARBONS

Robert M. Engelbrecht, deceased, late of St. Louis, Mo., by Alice M. Engelbrecht, executrix, St. Louis, James C. Hill, Chesterfield, and Richard N. Moore, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 29, 1970, Ser. No. 50,887

Int. Cl. C07c *15/10*

U.S. Cl. 260—669 10 Claims

A process for recovering aromatic hydrocarbons from styrene tar residues by thermally hydrocracking such residues.

3,631,215

PLATINUM COMPONENT-TIN COMPONENT-ALUMINA CATALYTIC COMPOSITE AND AROMATIZATION PROCESS USING SAME

Everett Clippinger, San Rafael, and Bernard F. Mulaskey, Fairfax, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Original application May 28, 1968, Ser. No. 732,588, now Patent No. 3,531,543, dated Sept. 29, 1970. Divided and this application July 15, 1970, Ser. No. 55,125

Int. Cl. C07c *5/26*

U.S. Cl. 260—673 4 Claims

Composites of a Group VIII noble metal, tin and an inorganic, solid, refractory oxide carrier have excellent dehydrogenation activities and little or no isomerization and cracking activities.

3,631,216

OLEFIN DEHYDRODIMERIZATION

Joseph Lipsig, Rosemont, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Apr. 4, 1966, Ser. No. 539,620

Int. Cl. C07c *3/20, 11/12*

U.S. Cl. 260—680 R 4 Claims

A dehydrodimerization process producing dienes and aromatic compounds by contacting an olefin stream containing acyclic olefins of three to four carbon atom as the sole reactant with a compound containing oxygen bonded to bismuth and active for the removal of a hydrogen atom from the terminal methyl group in said olefins.

3,631,217

PROCESS FOR INCREASING THE VISCOSITY OF POLYESTER RESINS, AND PRODUCTS OBTAINED THEREBY

Ronald R. Rabenold, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Mar. 9, 1967, Ser. No. 621,798

Int. Cl. C08f *21/02*

U.S. Cl. 260—863 11 Claims

An improved process for effecting the thickening of an unsaturated polyester resin composition containing a chemical thickening agent, such as magnesium oxide, which consists of adding water to the resin composition in amounts of from about 0.1 percent to about 1.0 percent, based on the weight of the polyester resin. The presence of water, in such small amounts, greatly accelerates the rate of thickening of the resin composition, thereby allowing an extremely efficient means for the preparation of semi-solid, resin-impregnated sheet materials, such as those used in molding applications.

3,631,218

DOUBLE BOND ISOMERIZATION OF OLEFINS

Melvin K. Carter, Moraga, Peter W. Glockner, Alameda, and John L. Van Winkle, San Lorenzo, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Apr. 30, 1970, Ser. No. 33,502

Int. Cl. C07c *5/22*

U.S. Cl. 260—683.2 10 Claims

Double bond isomerization of olefins is effected with a nickel chelate of a bidentate chelating ligand having a tertiary organophosphorus moiety and a carboxymethyl or carboxyethyl group attached directly to the phosphorus atom of the organophosphorus moiety.

3,631,219

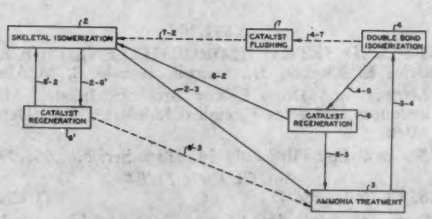
OLEFIN ISOMERIZATION USING AMMONIA-TREATED ALUMINA

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed July 23, 1970, Ser. No. 57,492

Int. Cl. C07c *5/22*

U.S. Cl. 260—683.2 10 Claims



Olefin hydrocarbons undergo double bond isomerization by contacting the olefin with a catalyst of ammonia-treated alumina. In a further embodiment, olefin hydrocarbons are alternatingly isomerized with respect to the

position of the double bond and then with respect to the skeletal arrangement of carbon atoms within a single catalytic reactor. The catalyst employed for the skeletal isomerization reaction is alumina, and the catalyst used for the double bond isomerization reaction is ammonia-treated alumina.

3,631,220
CURABLE ORGANOSILICON COMPOSITIONS
Lawrence F. Wojdac, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 20,027, Mar. 16, 1970. This application May 8, 1970, Ser. No. 35,939
Int. Cl. C08g *47/02*
U.S. Cl. 260—825 **12 Claims**

Solventless liquid monophenyl-methylvinylsiloxane resins, containing at least 20 mol percent dimethylsiloxy units, mixed with minor amounts of a low-viscosity fluid siloxane and the ≡SiH containing reaction product of methyl-hydrogen siloxanes and alpha-methyl styrene, are cured by heating in the presence of a platinum catalyst to provide a strong, heat-stable resin which can be used in laminates, coil coatings and the like.

3,631,221
EPOXIDE RESIN MIXTURES
Hans Batzer, Arlesheim, Juergen Habermeier, Allschwil, and Daniel Porret, Binningen, Switzerland, assignors to Ciba Limited, Basel, Switzerland
No Drawing. Continuation-in-part of application Ser. No. 870,547, Nov. 4, 1969. This application May 14, 1970, Ser. No. 37,299
Claims priority, application Switzerland, Nov. 11, 1968, 16,803/68; Jan. 30, 1970, 1,348/70
Int. Cl. C08g *45/00, 45/06*
U.S. Cl. 260—830 TW **8 Claims**

Epoxide resin mixtures, which are storage-stable and noncrystallising at room temperature, of (a) diglycidyl ethers of mononuclear, five-membered or six-membered, unsubstituted or substituted, oxyalkylated N-heterocyclic compounds which contain two NH groups in the molecule (for example 1,3-(2′-glycidyloxy-n-propyl)-5,5-dimethyl-hydantoin) and (b) polyglycidyl compounds of the N-heterocyclic series, which contain at least one heterocyclic ring which possesses the grouping

—NH—CO—

at least once, and wherein at least two glycidyl groups or β-methylglycidyl groups in the polyglycidyl compounds are directly linked to endocyclic nitrogen atoms (for example 1,3-diglycidyl-5,5-dimethylhydantoin). These epoxide resin mixtures have not been specifically described in the main patent.

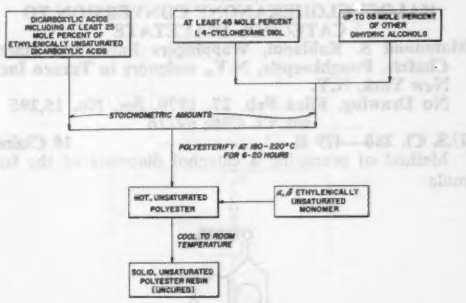
3,631,222
POLYARYLSULFONE GRAFT AND BLOCK COPOLYMERS WITH CHAINS OF POLYAMIDE ACID OR POLYIMIDE
Herward A. Vogel, Oakdale Township, Washington County, and Hans T. Oien, Lakeland, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Original application Mar. 22, 1967, Ser. No. 625,011. Divided and this application Jan. 2, 1970, Ser. No. 5,398
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 R **12 Claims**

Certain linear thermoplastic polyarylsulfones having reactive groups thereon are disclosed. The reactive groups can recur along the polymer chains and/or can occur at the ends of the chains. In addition, segmented (graft and block) copolymers containing polyarylsulfone segments are disclosed. The linear and segmented polymers have wide areas of utility, e.g. in coatings, impregnants, films, filaments, molded articles, etc.

3,631,223
LACTAM POLYMERIZATION WITH POLYTHIOLACTONE INITIATORS
Markus Matzner, Edison, and James E. McGrath and Sui-Wu Chow, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Apr. 27, 1970, Ser. No. 32,385
Int. Cl. C08g *20/00, 41/04*
U.S. Cl. 260—857 **8 Claims**

Polythiolactones are utilized as polymerization initiators or activators with alkaline catalysts in the anionic polymerization of lactam monomers so as to provide for a rapid polymerization process. The polymers thus obtained have good physical properties and good color.

3,631,224
UNSATURATED POLYESTER RESIN MOLDING POWDER
Melvin E. Baum, Monroeville, Pa., assignor to Koppers Company, Inc.
Continuation-in-part of application Ser. No. 690,935, Dec. 15, 1967. This application June 25, 1970, Ser. No. 49,780
Int. Cl. C08f *21/00, 21/02*
U.S. Cl. 260—861 **6 Claims**


DICARBOXYLIC ACIDS INCLUDING AT LEAST 25 MOLE PERCENT OF ETHYLENICALLY UNSATURATED DICARBOXYLIC ACIDS
AT LEAST 45 MOLE PERCENT 1,4-CYCLOHEXANE DIOL
UP TO 55 MOLE PERCENT OF OTHER DIHYDRIC ALCOHOLS
STOICHIOMETRIC AMOUNTS
POLYESTERIFY AT 180–220°C FOR 6–20 HOURS
HOT, UNSATURATED POLYESTER
α,β ETHYLENICALLY UNSATURATED MONOMER
COOL TO ROOM TEMPERATURE
SOLID, UNSATURATED POLYESTER RESIN (UNCURED)

An unsaturated polyester resin which is a solid capable of being ground into a free flowing powder at room temperature comprises a mixture of an α,β-ethylenically unsaturated monomer and a condensation polymer formed by esterifying a dicarboxylic acid, at least a portion of which contains ethylenic unsaturation, with a dihydric alcohol wherein at least a portion of the dihydric alcohol comprises 1,4-cyclohexane diol.

3,631,225
PREPARATION OF POLYVINYL ACETALS
Linwood P. Tenney, Durham, N.C., and Robert D. Lundberg, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Apr. 28, 1970, Ser. No. 32,717
Int. Cl. C08f *29/50*
U.S. Cl. 260—874 **10 Claims**

The preparation of polyvinyl acetals having a vinyl ester content of about 12 to 25% and a polyvinyl alcohol content of about 7 to 10% was achieved in non-aqueous dispersions by the addition of a swelling agent. The swelling agent is preferably an alkylene glycol alkyl ether, such

as 1,2-dimethoxyethane although diethylene glycol alkyl ethers, dioxane, tetrahydrofuran, or tetrahydrothiophene can also be used.

3,631,226
VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

William H. Wineland, deceased, late of Midland, Mich., by Elizabeth R. Wineland, executrix, Midland, and Frank V. Goff, Sanford, and Fred Stevenson, Beaverton, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,127
Int. Cl. C08f *37/18*
U.S. Cl. 260—897 C **5 Claims**

This invention is directed to improved polymeric compositions comprising in intimate blended combination:

(1) from about 91 to 95 percent by weight, based on the total weight of the composition of a normally crystalline vinylidene chloride polymer containing from about 70 to about 95 percent by weight of vinylidene chloride,

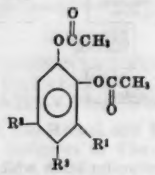
(2) from about 5 to 9 percent by weight of an ethylene polymer having a hydroxyl number of from about 150 to 225 as determined by ASTM Test No. D–1638, modified, and a melt index of at least about 5 to about 385 determined at 190° C./2160 g.; wherein these composoitions provide polymeric film materials having unexpectedly enhanced resistance to tear and include compositions having, in addition, significantly enhanced low temperature flexibility.

3,631,227
HALOCYCLOHEXANONE CONVERSION TO CATECHOL DIACETATE

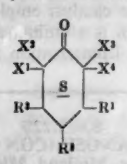
Mahmoud S. Kablaoui, Wappingers Falls, and Harry Chafetz, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,295
Int. Cl. C08c *69/16*
U.S. Cl. 260—479 R **10 Claims**

Method of preparing a catechol diacetate of the formula:



where R^1, R^2, and R^3 are hydrogen or alkyl comprising contacting a halocyclohexanone of the formula:



where R^1, R^2 and R^3 are as heretofore defined and X^1, X^2, X^3 and X^4 are hydrogen or halogen at least one of the X members being halogen with acetic anhydride in the presence of a catalytic amount of a substance selected from the group consisting of boron trifluoride etherate, pyridine, concentrated sulfuric acid and hydrochloric acid, subsequently contacting the resultant mixture with concentrated sulfuric acid.

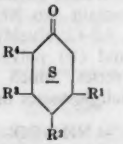
3,631,228
PREPARATION OF BENZENE ACETATES

Mahmoud S. Kablaoui, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,296
Int. Cl. C07c *69/14, 69/16*
U.S. Cl. 260—479 R **2 Claims**

A method of preparing benzene acetates and diacetates of the formula:

where R^1, R^2 and R^3 are hydrogen or alkyl of from 1 to 20 carbons, R^4 is alkyl of from 1 to 20 carbons and Y is hydrogen or an acetoxy radical comprising contacting a cyclohexanone of the formula:



where R^1, R^2, R^3 and R^4 are as heretofore defined with a mixture of concentrated sulfuric acid and acetic anhydride.

ELECTRICAL

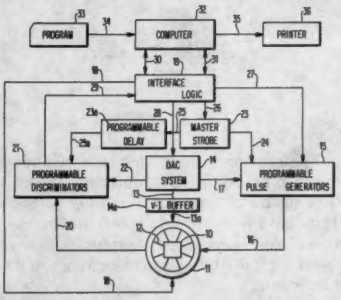
ERRATA

For Classes 174—73, 179—1, 200—61, 200—148, 200—175, 219—9 and 219—366 see:
Patent Nos. 3,630,347 and 3,631,519 thru 3,631,525

3,631,229
MONOLITHIC MEMORY ARRAY TESTER

Frederick N. Bens, Hopewell Junction; Kamal E. Dimitri, Poughkeepsie, both of N.Y.; Michael J. Moore, Winooski; John E. Tomko, Shelburne, both of Vt., and Walter W. Wajda, Hyde Park, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 30, 1970, Ser. No. 76,922
Int. Cl. G01r *15/12*
U.S. Cl. 235—153 **8 Claims**

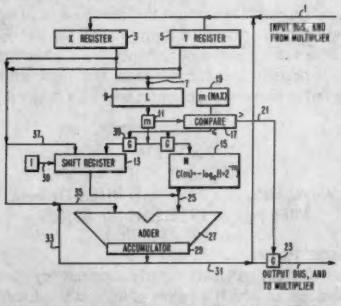


A method and apparatus are disclosed for testing on a simulated real time basis a chip or monolithic memory array. The tester is interfaced to a computer with which it communicates in a cycle steal mode of operation. The test pattern which tests the basic failure modes that can occur in the array is loaded into an area of the computer core storage whose address is given to the tester by an instruction. Another core address is given to the tester which is the area where results of the test are stored. A failure diagnosis program makes a decision as to which failure mode occurred, and the results of the diagnosis are printed out with digital coding to indicate the type of failure. Since the entire test is done in continuous cycle steal mode, the time involved is only a few milliseconds, depending on the length of the pattern.

3,631,230
BINARY ARITHMETIC UNIT IMPLEMENTING A MULTIPLICATIVE STERATION FOR THE EXPONENTIAL, LOGARITHM, QUOTIENT AND SQUARE ROOT FUNCTIONS

Tien Chi Chen, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,053
Int. Cl. G06f *7/48*, *7/52*
U.S. Cl. 235—164 **7 Claims**

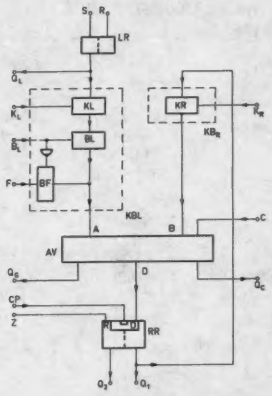


Apparatus and a method is described for efficiently achieving arithmetic evaluations for functions such as exponential, logarithm, quotient, and square root with a minimum use of multiplications or divisions. Basically, use is made of the fact that $x(1\pm2^{-m})$ can be evaluated by a shift followed by an add. A pair of numbers (x_k, y_k) can represent a function x: $f(x)g(x_k, y_k)$, such that $g(l, y_n)=y_n$ for logarithm, quotient and square root. Then, multiplication by shifting is applied to x_k with suitable adjustments on y_k, until x_k is close to unity, at which time y_k represents the desired answer. The exponential is computed by essentially reversing the logarithm procedure. A termination algorithm further improves accuracy. The apparatus involves two registers for x_k and y_k, a local memory, an adder and a shift register.

3,631,231
SERIAL ADDER-SUBTRACTER SUBASSEMBLY

Klaus Lagemann, Garstedt, and Bernd Schendel, Tornesch, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1970, Ser. No. 8,285
Claims priority, application Germany, Feb. 15, 1969, P 19 07 789.5
Int. Cl. G06f *7/50*
U.S. Cl. 235—176 **7 Claims**



An adder-subtracter subassembly for the arithmetic unit of a digital computer. The subassembly adds or subtracts two serially received binary digits by storing each in a one-bit input register and by selectively complementing and blocking each stored digit before it is introduced into a full adder. The output of the full adder is read into a clocked output register, the output of which is connected through a second selectively operated complementing circuit and blocking circuit to a second input of the full adder.

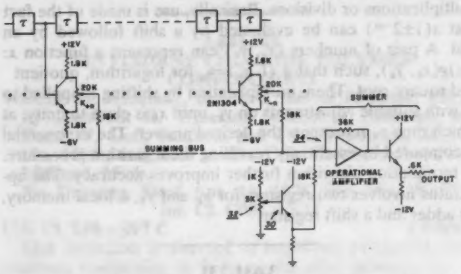
3,631,232
APPARATUS FOR SIMULATING THE ELECTRICAL CHARACTERISTICS OF A NETWORK

Donald A. Perreault, Pittsford, and Donald E. Mack, Rochester, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Oct. 17, 1969, Ser. No. 867,348
Int. Cl. G06g *7/62*
U.S. Cl. 235—185 **8 Claims**

A method of simulating the electrical characteristics of a network by utilizing a tapped delay line, the output taps of which are connected to variable gain devices. The gain of said devices are computed and then adjusted to the com-

puted value. The outputs of the variable gain devices are summed in a summing device, the ratio of the signal at the



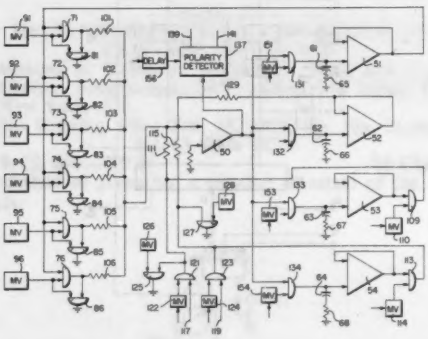
output of the summing device to the signal applied to the input of the tapped delay line corresponding to the simulated characteristic.

3,631,233

BINARY VECTOR ROTATOR AND ANGLE-TO-BINARY CONVERTER

Joseph V. McKenna, Franklin Lakes, N.J., assignor to The Singer Company, New York, N.Y.

Filed Aug. 8, 1969, Ser. No. 848,519
Int. Cl. G06g 7/22; H03k 13/17
U.S. Cl. 235—186 **11 Claims**



This specification discloses an analogue system comprising an operational amplifier, a plurality of analogue hold amplifiers, which operate to store an applied signal voltage level, a plurality of precision resistors and a programming means which controls successive summing operations in the operational amplifier and the storage of the resulting sums in the analogue hold amplifiers to carry out the desired conversion of the analogue input signals to a desired digital number. Alternatively, the system can be operated to carry out a desired rotation of a vector represented by analogue signals through a digitally represented angle.

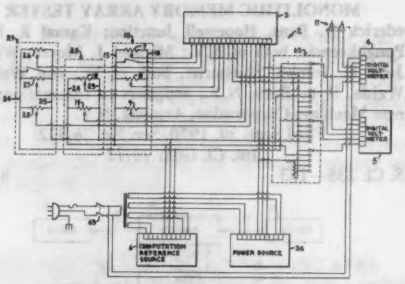
3,631,234

ELECTRICAL APPARATUS FOR OBTAINING FILTER PACK DENSITY VALUES

John V. Hanline, Kansas City, Mo., and Daniel M. Chapin, Shawnee Mission, Kans., assignors to Film Equipment Manufacturing Co., Kansas City, Mo.

Filed Feb. 24, 1969, Ser. No. 801,350
Int. Cl. G06g 7/48; G01j 3/46
U.S. Cl. 235—193 **4 Claims**

Electrical apparatus for obtaining density values for a filter pack for use with a production color film by comparing density values of a standard color film and its filter pack with the production color film, said apparatus having visual indicators for displaying the obtained net density values for the filter pack for the production color film. A computation circuit is electrically connected to the visual indicators and to a standard color film circuit and to a pack control circuit and to a



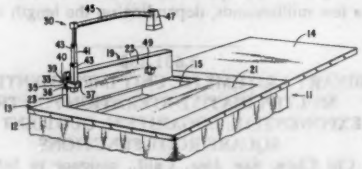
production color film circuit for electrically processing signals from a plurality of potentiometers in the respective circuits. The signals correspond to density values associated with the respective item recorded therein whereby when the computation circuit is activated, numerical density values for the filter pack for the production color film are displayed by the visual indicators.

3,631,235

FOLD AWAY LAMP FOR A SEWING MACHINE CABINET

Charles R. Odermann, Montville, and Albert L. Newman, Dover, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 20, 1970, Ser. No. 38,949
Int. Cl. D05b 79/00
U.S. Cl. 240—2.14 **2 Claims**



A light source is pivotally mounted onto the front flap of a sewing machine cabinet so as to provide illumination for a sewing work support area when the machine is in operation; the light source also provides illumination for the work support area of a sewing machine cabinet even when the sewing machine is stored in the cabinet, and the light source itself may be stored in the sewing cabinet when so desired.

3,631,236

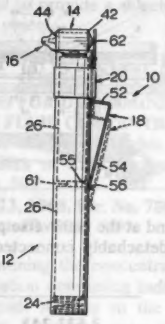
FLASHLIGHT

Walter J. Woytowich, Box 338, Deep River, Ontario, Canada

Filed July 1, 1970, Ser. No. 51,439
Int. Cl. F21l 7/00
U.S. Cl. 240—10.67 **11 Claims**

A miniature flashlight particularly adapted for illuminating confined spaces, in which a beam of light is produced at right angles to the axis of the flashlight. The flashlight has a cylindrical case that is provided at one end with a U-shaped clip,

the clip being formed to hold a bulb in transverse position in contact with a battery in the case. A switch is slidably attached to the case for completing an electrical circuit between the bulb and the battery.



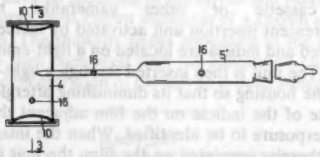
ERRATA

For Classes 250—83 and 250—103 see:
Patent Nos. 3,631,526 and 3,631,527

3,631,237
HIGH TEMPERATURE CELLS

Michael John Sole, Randburg, and Peter John Walker, Johannesburg, both of Republic of South Africa, assignors to Anglo American Corporation of South Africa Limited

Filed June 2, 1970, Ser. No. 42,804
Claims priority, application Republic of South Africa, June 4, 1969, 69/3973
Int. Cl. G01n *21/26*
U.S. Cl. 250—43.5 R **10 Claims**



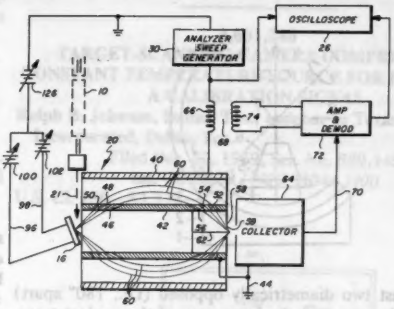
For examining gases in infrared spectrometers and other types of spectrometers the gases are pumped into a space with opposed windows adapted to be positioned along the line of examination. To seal off the gas inside and to withdraw the gas a curtain of an inert gas is flowed on the outside past each of the windows.

3,631,238
METHOD OF MEASURING ELECTRIC POTENTIAL ON AN OBJECT SURFACE USING AUGER ELECTRON SPECTROSCOPY

Noel C. MacDonald, Thousand Oaks, Calif., assignor to North American Rockwell Corporation

Filed Nov. 17, 1969, Ser. No. 877,358
Int. Cl. H01j *37/26;* **G01n** *23/00*
U.S. Cl. 250—49.5 A **14 Claims**

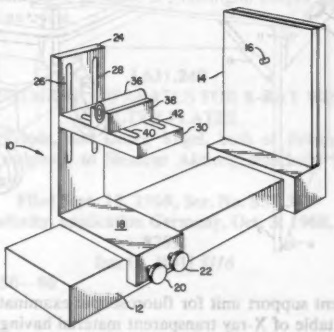
A method and apparatus for quantitatively measuring potential on surfaces with submicron spatial resolution employs conventional scanning electron microscope and electron energy analyzer to obtain potential measurements and, in effect, a map of potential at different points on a surface such as a semiconductor or integrated circuit device. A micrograph of the surface to be analyzed is employed to locate points at which potential is to be measured. An Auger electron spectrum including several Auger peaks characteristic of secondary electrons emitted from a point of known potential on which the electron beam of the microscope impinges is first obtained. Then either the potential on the surface at that point is changed or the electron beam is moved to a second point and a second Auger electron spectrum is obtained. The magnitude of the shift in corresponding Auger peaks from the first spectrum to the second spectrum constitutes a direct quantitative measure of the potential of the second point with respect to the potential of the first point.



3,631,239
SPECIMEN ALIGNMENT REFERENCE APPARATUS FOR BACK REFLECTION X-RAY CAMERA

James F. Kreider, Santa Barbara, Calif., assignor to Avco Corporation, Cincinnati, Ohio

Filed June 24, 1970, Ser. No. 48,979
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 **4 Claims**



A specimen alignment reference apparatus is disclosed which permits an operator to locate precisely a portion of a specimen relative to a reference point. A viewing device is adjustably supported above a reference plane. The viewing device is adjustable in the X and Z directions relative to the reference plane wherein the viewing device may be precisely aligned relative to a given reference point.

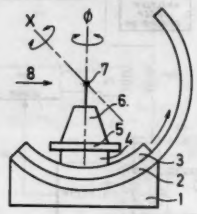
3,631,240
APPARATUS FOR HOLDING AND ORIENTING A CRYSTAL IN X-RAY INSTRUMENTS MEASURING THE MICROSTRUCTURE THEREOF

Walter Hoppe, Schillerstrasse 46, 8000 Munich 15, Germany

Filed June 9, 1969, Ser. No. 831,646
Claims priority, application Germany, June 27, 1968, P 17 72 741.2
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 **6 Claims**

A crystal to be examined by X-rays is held on a goniometer head rotatable with the crystal about an axis (ϕ-axis) passing

through both the crystal and the goniometer head. The latter is mounted in a goniostat in such a manner that said ϕ-axis, contained in the vertical plane of the goniostat, is transposable to at least two diametrically opposed (i.e., 180° apart) positions with respect to the inner race of the goniostat carrying the goniometer head.

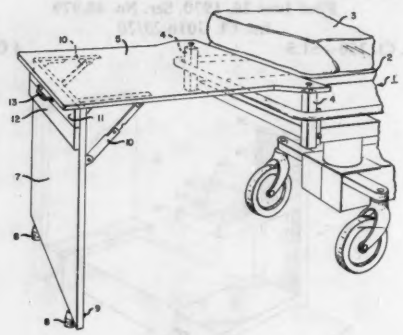


3,631,241

PATIENT SUPPORT FOR FLUOROSCOPIC EXAMINATION

Frederick R. Franke, Mount Lebanon Township, and George E. Pettengill, Franklin Park, both of Pa., assignors to The Western Pennsylvania Hospital, Pittsburgh, Pa.

Filed Nov. 3, 1969, Ser. No. 873,583
Int. Cl. G01n *21/00*
U.S. Cl. 250—54 **3 Claims**



A patient support unit for fluoroscopic examination comprising a table of X-ray transparent material having a pair of guides at one end adapted to fit guideways of conventional hospital beds used to retain movable head and footboards and at least one leg at the opposite end to support the table in cooperation with the bed at a height equal to the elevation of the bed. The connection between the table and leg may be hinged so as to make the support unit foldable.

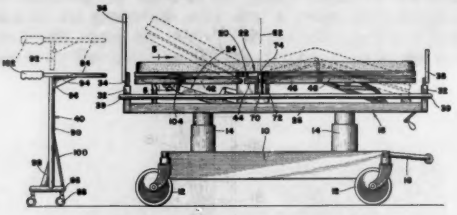
3,631,242

FLUOROSCOPE TOP FOR CARDIAC BED WHICH IS SWINGABLE ABOUT A VERTICAL AXIS OF THE BED

Earl Leonard Williams, Medina, Ohio, assignor to Simmons Company, New York, N.Y.

Filed June 17, 1969, Ser. No. 834,006
Int. Cl. G03b *41/16*
U.S. Cl. 250—55 **6 Claims**

A fluoroscope top for a vehicular invalid bed or the like upon which the patient may be trundled to the site of the fluoroscopic examination. The patient is supported upon an X-ray transparent pallet which is pivoted at one side edge, somewhat medially thereof, on a supporting underframe upon which it may be swung clear of the understructure of the bed and transversely thereof to emplace the upper part of the patient's body into a radiation field free of the shielding understructure of the bed. The pallet is supported during such movement and at the transverse position by an auxiliary carriage that is detachably connected to the pallet at the head end thereof.

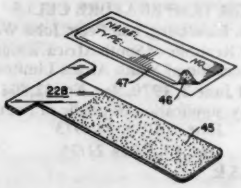


3,631,243

X-RAY FILM MARKING MEANS INCLUDING A FLUORESCENT TONGUE OVERLAYED WITH OPAQUE INDICIA

William H. Byler, Landing, N.J.; Halsey L. Raffman, Brooklyn, N.Y., and Frank Masi, Morristown, N.J., assignors to United States Radium Corporation

Filed Feb. 25, 1970, Ser. No. 14,024
Int. Cl. H05g *1/28*
U.S. Cl. 250—67 **5 Claims**



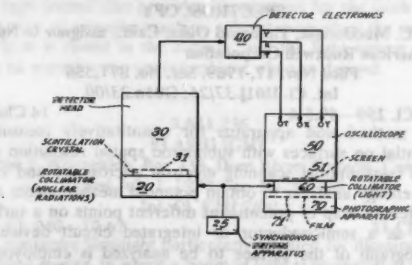
For purposes of identifying particular film exposures in an X-ray cassette or other cameralike housing, a phosphorescent insertion unit activated by incident radiation is provided and indicia are located on a light-emitting surface thereof. The unit is then inserted through a light-sealed aperture in the housing so that its diminishing afterglow casts the silhouette of the indicia on the film adjacent the particular area of exposure to be identified. When the image of the indicia is thereby imprinted on the film, the unit is withdrawn from the housing through the aperture.

3,631,244

TOMOGRAPHIC RADIATION CAMERA WITH MECHANICAL READOUT

Lowell C. Bergstedt, Schaumberg, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Mar. 13, 1969, Ser. No. 806,839
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 S **8 Claims**



An Anger-type radiation detector fitted with synchronously rotating slanted hole collimators adjacent the

crystal and output phosphor screen to enable tomographic imaging of a three-dimensional distribution of radionuclides in an object. Alternatively a precessing film plane viewing the output screen may be synchronized with the rotating collimator adjacent the crystal to provide a selected in-focus image of a plane through the object.

3,631,245

NEUTRON METHOD FOR DETERMINING RESIDUAL OIL-PHASE FLUID CONCENTRATION

James R. Jorden, Jr., Hacienda Heights, and Forrest R. Mitchell, Ventura, both of Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 23, 1968, Ser. No. 786,132
Int. Cl. G01v *5/00*
U.S. Cl. 250—83.3 **6 Claims**

A method for determining the concentration of oil-phase fluid in an earth formation containing indigenous oil-phase fluid and aqueous liquid. A zone in the formation is irradiated with neutrons when the zone is filled with indigenous oil-phase and aqueous liquid. The thermal neutron capture rate response of the zone is measured with respect to the first irradiation. Substantially all indigenous oil-phase is removed from the zone and the zone is filled with only an aqueous liquid substantially equivalent in composition to the indigenous aqueous liquid. The zone is irradiated with neutrons a second time and the thermal neutron capture rate response of the zone is measured with respect to the second irradiation.

3,631,246

METHOD FOR DETERMINING THE PURITY OF RECOVERED SYLVITE

Herbert H. Defriez, Berkeley, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,447
Int. Cl. G01n *21/00*
U.S. Cl. 250—83.3 H **3 Claims**

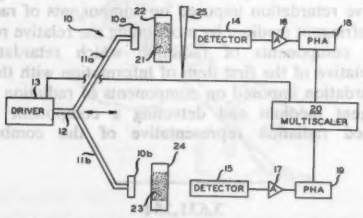
A method for determining the purity of recovered sylvite by taking an infrared spectrum of the sylvite and making up a calibration curve from known standards of a known impurity on the sylvite. The impurity peaks appearing in the infrared spectrum are then compared with the calibration curve and the impurity concentration of the sylvite is determined.

3,631,247

MOSSBAUER GAMMA RAY SPECTROMETER

Hugh M. Barton, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Mar. 26, 1969, Ser. No. 810,723
Int. Cl. G01t *1/17, 1/36*
U.S. Cl. 250—83.3 R **9 Claims**



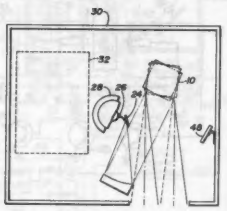
A catalyst containing a nuclide which exhibits the Mossbauer effect is irradiated with gamma rays while scanning through resonance conditions, the gamma radiation transmitted through the catalyst is measured and reactants are contacted with the catalyst as the measurement proceeds. The spectrometer includes apparatus for passing a second gamma-ray beam through a second absorbing body of similar characteristics to the body to be analyzed, a signal being produced representative of the difference in intensity of the two beams of gamma radiation, as a function of velocity.

3,631,248

TARGET-SCANNING CAMERA COMPRISING A CONSTANT TEMPERATURE SOURCE FOR PROVIDING A CALIBRATION SIGNAL

Ralph B. Johnson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1969, Ser. No. 889,145
Int. Cl. G02b *17/00;* **H04n** *3/00*
U.S. Cl. 250—83.3 H **5 Claims**



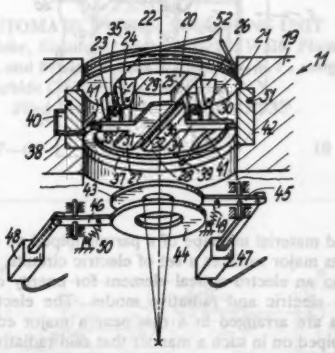
To scan a target area, a polygon-shaped scan mirror is mounted to rotate about one axis and oscillate about an axis orthogonal thereto. Oscillation about the second orthogonal axis is tailored to a desired motion by means of an eccentric cam. Radiation incident on the rotating and oscillating scan mirror is reflected to a radiant energy detector by means of a convergent mirror. The convergent mirror is track-mounted and adjustable to vary the focal range focal range for scanned areas at different locations. A constant temperature area is scanned to produce a meaningful output signal prior to each scan cycle.

3,631,249

ADJUSTMENT APPARATUS FOR X-RAY WEDGE FILTER PLATES

Manfred Friede, and Georg Vogel, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 12, 1969, Ser. No. 857,347
Claims priority, application Germany, Oct. 3, 1968, P 18 00 879.2
Int. Cl. H01j *5/16*
U.S. Cl. 250—86 **1 Claim**



A primary ray diaphragm for X-ray examining devices has plate diaphragms limiting the ray field, whereby those parts of the plate diaphragms which are adjacent to the ray field

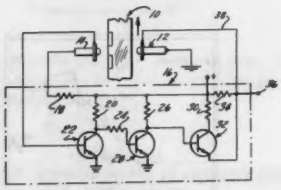
being limited have an absorption value producing a half shade effect and corresponding to that of an iron plate having a thickness of 0.4 to 3.5 mm.

3,631,250

OPTICAL POSITIVE FEEDBACK SENSOR CIRCUIT

Lyman F. Van Buskirk, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 13, 1970, Ser. No. 11,222
Int. Cl. G01j *1/32*
U.S. Cl. 250—205 **1 Claim**



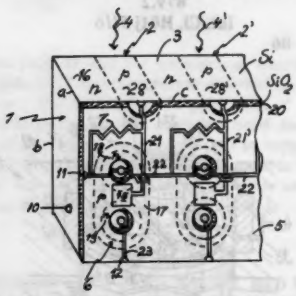
An optical positive feedback sensor circuit which converts regularly coded information into electrical signals. When not obstructed by the coded opaque pattern on a moving information carrier light from a light emitting diode is detected by a phototransistor. The output of the phototransistor is then amplified. A portion of the amplifier output provides positive feedback through the light emitting diode, driving the circuit into saturation. A circuit is included to maintain a light level at least sufficient to restart the operation after a period of light obstruction.

3,631,251

ARRAY COMPRISING ROW OF ELECTRO-OPTICAL ELEMENTS AND ASSOCIATED ROW OF SEMICONDUCTING MICROCIRCUITS LOCATED ON ADJOINING FACES OF A PARALLELEPIPEDAL SLAB

Kurt Lehovec, 11 Woodlawn Drive, Williamstown, Mass.

Filed Feb. 26, 1970, Ser. No. 14,362
Int. Cl. H01j *31/50, 39/12*; H05b *37/00*
U.S. Cl. 250—208 **15 Claims**



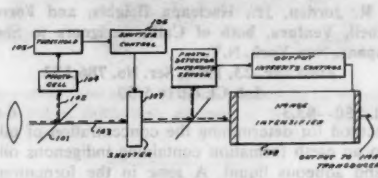
A solid material in shape of a parrallelpiped on carries on one of its major surfaces a set of electric circuits, each connected to an electro-optical element for energy conversion between electric and radiative modes. The electro-optical elements are arranged in a row near a major edge of the parallelpiped on in such a manner that said radiative mode is directed perpendicular to said edge thus defining a row of points for light emission, reception or modulation along said edge. A set of such parallelpiped on is stacked to provide a two-dimensional array of such points for light emission, reception or modulation.

3,631,252

IMAGE CONTROL APPARATUS UTILIZING THE CONVOLUTION OF PHOSPHORS

Radames K. H. Gebel, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Mar. 24, 1970, Ser. No. 22,301
Int. Cl. H01j *31/50, 39/12*
U.S. Cl. 250—213 VT **3 Claims**



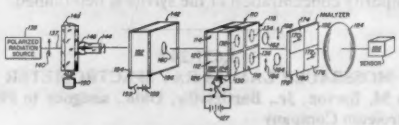
By using the delay time incurred in image reproduction brought about by the convolution action of the phosphor in image converter tubes, time is obtained in which to turn off the reproduction of the image or to lower the reproduction intensity so that the intensity of the oncoming image will not damage a camera tube or overexpose photographic film. Conversely, time may be achieved in which to turn the image on, likewise to a camera tube or photographic film, or reproducing or recording a fast-acting phenomenon such as a lightning flash or bomb burst without the necessity of wasteful continuous exposure in order to "catch" the desired image.

3,631,253

LOGIC COMPARATOR USING BIREFRIGENT MEDIUM

Ralph Edward Aldrich, Woburn; Paul John Caruso, Bedford, and Donald Sears Oliver, Acton, all of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed May 28, 1969, Ser. No. 828,657
Int. Cl. G08c *9/06*
U.S. Cl. 250—219 **27 Claims**



Apparatus is disclosed for comparing a first item of information represented by the sense and magnitude of the relative retardation of components of radiation with a second item of information represented by the sense and magnitude of relative retardation imposed on components of radiation by a birefringent medium by modulating the relative retardation of components of radiation which retardation is representative of the first item of information with the relative retardation imposed on components of radiation by the birefringent medium and detecting a component of the modulated radiation representative of the combination thereof.

3,631,254

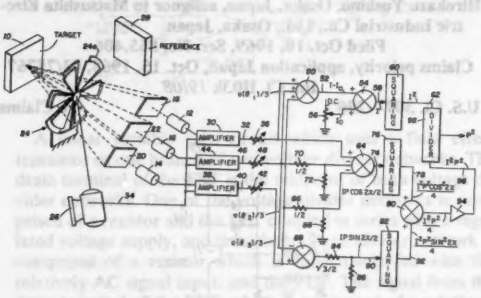
OBJECT IDENTIFICATION BY EMISSION POLARIZATION

Dennis O. Covault, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1969, Ser. No. 889,406
Int. Cl. G02f *1/18*
U.S. Cl. 250—225 **15 Claims**

Metallic objects are identifiable by the degree of polarization of infrared radiation emitted therefrom. To identify a

metallic object from a nonmetallic object by radiation emitted therefrom, three linearly polarized detectors are positioned to be responsive to the emitted radiation. Each of these three detectors is responsive to radiation from the object along a different plane of polarization. Output signals from the three detectors are processed in a system to produce a signal equal to the square of the degree of



polarization. Smooth objects are distinguishable from rough objects in the same field of view by determining the degree of polarization of a light beam directed to and reflected from the objects. By knowing the polarization axis of the light waves at the source, the output signals of two detectors may be combined to highlight in a display smooth objects in a field of view that contains both smooth and rough objects.

3,631,255

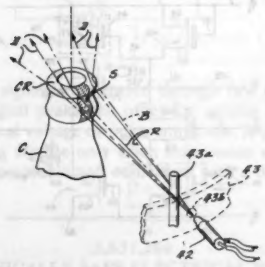
CONTAINER CROWN RING INSPECTION APPARATUS HAVING MEANS DISPOSED BETWEEN LAMPS AND CROWN RING FOR OBSTRUCTING RADIAL RAYS FROM LAMPS

James R. Gender, Kirkwood; Leonard V. Makela, Chesterfield, and Karl Wolf, Webster Groves, all of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Continuation of application Ser. No. 773,759, Nov. 6, 1968, now abandoned. This application Nov. 16, 1970, Ser. No. 90,044

Int. Cl. G01n *21/32*; G06m *7/00*; H01j *39/12*

U.S. Cl. 250—223 B **5 Claims**



A crown ring defect inspection apparatus for beverage containers and the like comprising automatic inspection means for detecting crown ring chips and irregularities in a moving line of containers and rejecting the defective containers. The apparatus includes photoelectric means for examining each container as well as photomultiplier means responsive to optical signals for converting such signals to electrical signals which actuate the reject mechanism.

3,631,256

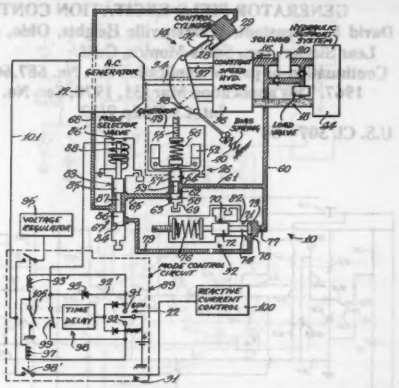
EMERGENCY POWER UNIT

Richard W. Reynolds, Rockford, Ill., assignor to Sundstrand Corporation

Filed Apr. 13, 1970, Ser. No. 27,682

Int. Cl. H02k *7/18*

U.S. Cl. 290—30 A **11 Claims**



An emergency power unit for an aircraft adapted to selectively supply either emergency electrical power or emergency hydraulic power to the respective electrical and hydraulic systems of the craft including an AC generator-motor unit drivingly interconnected with a reversible displacement hydraulic motor-pump unit with a governor control responsive to the AC unit speed for supplying hydraulic fluid to a displacement control motor to maintain a substantially constant speed of the AC unit when acting as a generator, and a pressure compensator responsive to the pressure of fluid from the hydraulic unit when acting as a pump for controlling the displacement of the hydraulic unit to maintain a substantially constant hydraulic unit outlet pressure to supply emergency hydraulic power to the system, there being also provided a mode selection circuit which depressurizes the hydraulic unit when the hydraulic power mode is selected to permit the AC unit when acting as a motor to come up to speed unloaded.

ERRATUM

For Class 307—251 see:
Patent No. 3,631,528

3,631,257

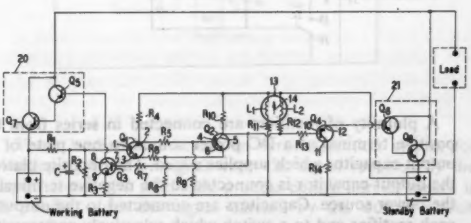
AUTOMATIC POWER SWITCHING UNIT

Byron C. Behr, Stamford; Richard Head, White Plains, both of Conn., and Frederick Soskel, Peekskill, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,033

Int. Cl. H02j *9/06*

U.S. Cl. 307—66 **10 Claims**



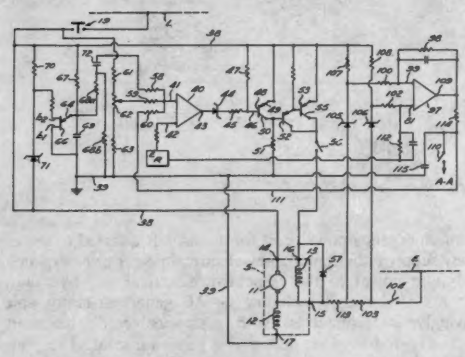
A switching unit for automatically switching a load from a working power supply to a standby power supply when the

voltage of the working supply decreases to a predetermined level and then to automatically switch the load back to the working supply when and if it increases above the predetermined level.

3,631,258
DC PROTECTION AND CONTROL PANEL WITH GENERATOR FIELD EXCITATION CONTROL

David L. Eisenstadt, Warrensville Heights, Ohio, assignor to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of application Ser. No. 687,667, Dec. 4, 1967. This application Mar. 31, 1970, Ser. No. 24,091
Int. Cl. H02p *9/30*
U.S. Cl. 307—84 9 Claims

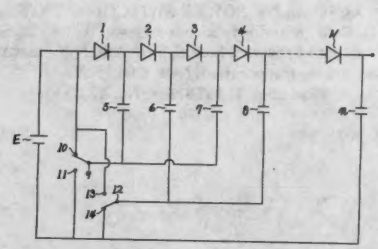


A system for controlling the operation of and protecting a DC generator alone and in a parallel system of DC generators. The system performs the general control functions of voltage regulation, generator paralleling, load equalization, and the general protection functions of fault detection, overvoltage protection, and including the taking of appropriate action such as disconnecting or preventing the disconnection of the controlled generator from a parallel system.

3,631,259
APPARATUS FOR BOOSTING A DIRECT CURRENT VOLTAGE

Kenmatu Kiyota, 16-6, 2 chome, Nishiasa, kusa, Taito Ku, Tokyo, Japan

Filed Apr. 14, 1970, Ser. No. 28,397
Int. Cl. H02m *3/06, 3/08*
U.S. Cl. 307—110 7 Claims

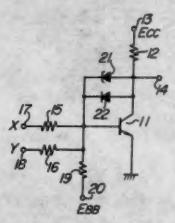


A plurality of rectifiers are connected in series from the positive terminal of a DC power source to one plate of an output capacitor which supplies a load. The opposite plate of the output capacitor is connected to the negative terminal of the power source. Capacitors are connected to the output of each rectifier and to a switch which selectively connects the capacitors to either the positive or negative side of the power source. The switch operates to accomplish successive switching operations, and when the capacitors connected to the outputs of the source are connected to the positive power source terminal, the remaining rectifier output capacitors are connected to the power source negative terminal. The switch operates to successively change these reverse relationships.

3,631,260
LOGIC CIRCUIT

Hirokazu Yoshino, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 10, 1969, Ser. No. 865,406
Claims priority, application Japan, Oct. 15, 1968, 43/75767
Int. Cl. H03k *19/08*
U.S. Cl. 307—206 6 Claims

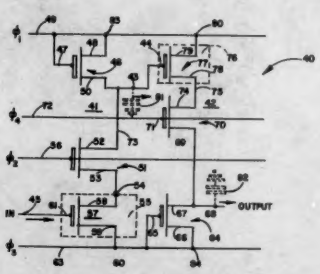


An Esaki diode and a high-conduction diode are connected in parallel across the base-collector junction of a transistor junction of a transistor to constitute a logic circuit. The input-output curve of this transistor shows a hysteresis characteristic and the transition of the output state can be done in a very short time with stable operation. Connection of a plurality of such logic circuits in a ring provides a frequency divider circuit operating at a high speed. Combination of a plurality of such logic circuits with delay elements constitutes an astable, monostable, bistable multivibrator or other high-speed logic circuit.

3,631,261
COMPACT LAYOUT FOR MULTIPHASE SHIFT REGISTER

Gary L. Heimbigner, Anaheim, Calif., assignor to North American Rockwell Corporation, Anaheim, Calif.

Filed July 6, 1970, Ser. No. 52,403
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 C 10 Claims



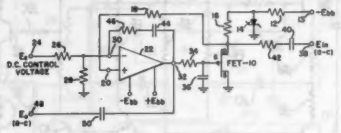
A field effect transistor shift register gated by a multiphase clocking scheme is layed out on a semiconductor substrate so that adjacent half bits of a single tiered and corresponding half bits of a multitiered shift register time share certain clocking lines during the output precharge and input evaluation phases of an operating cycle of a half-bit stage. The time sharing of the clocking lines enables the corresponding half-bit stages of a multitiered shift register to time share field effect transistor devices.

3,631,262

LINEAR VARIABLE GAIN CIRCUIT UTILIZING A FIELD EFFECT TRANSISTOR

Robert J. Jarrett, Shelburne, Vt., assignor to General Electric Company

Filed Mar. 31, 1970, Ser. No. 24,132
Int. Cl. G06g 7/16
U.S. Cl. 307—229 9 Claims



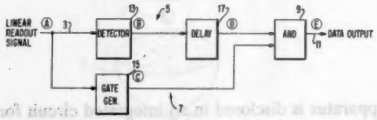
A linear variable gain circuit which uses a field effect transistor as one branch of two voltage divider networks. The drain terminal of the FET is the midpoint of both voltage divider networks. One of the voltage divider networks is comprised of a resistor and the FET coupled in series with a regulated voltage supply, and the other voltage divider network is comprised of a resistor which is capacitively fed with the relatively AC signal input, and the FET. The signal from the drain terminal of the FET, which is comprised of a relatively DC voltage level and a relatively AC voltage level, and which are responsive to the drain to source resistance of the FET, is fed back as one input to a differential operational amplifier. The other input to the DOA is a relatively DC control signal, in response to which the gain of the circuit is to vary. An AC feedback loop is also provided around the DOA. The DC voltage on the two inputs are compared by the DOA and any DC difference is passed, via a decoupling network, to the gate terminal of the FET to vary the value of its drain to source resistance. The AC signal from the drain terminal at the DOA input is amplified and taken from the DOA output via a capacitor.

3,631,263

SIGNAL DETECTION CIRCUIT

Ian H. Graham; Harry A. Skovmand, and Jack S. Swartz, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 9, 1970, Ser. No. 1,666
Int. Cl. H03k 17/00
U.S. Cl. 307—231 10 Claims



A readout signal is channeled through two paths, one for identifying signal peaks, the other for sensing slope and net change of signal voltage or pulse amplitude. A gate generator allows reading a pulse only when slope sense and amplitude change are acceptable and coincident with a detected signal peak.

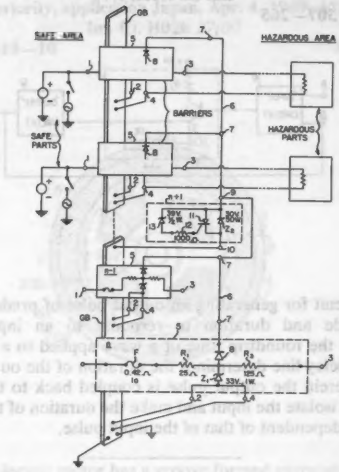
3,631,264

INTRINSICALLY SAFE ELECTRICAL BARRIER SYSTEM AND IMPROVEMENTS THEREIN

Martin J. Morgan, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,364
Int. Cl. H03k 5/08
U.S. Cl. 307—237 36 Claims

A multiple barrier system for limiting transfer of electrical energy to intrinsically safe levels, including *n* individual barriers each having a fuse and two resistors in series and a zener diode for limiting the voltage at the junction of the resistors. A high-voltage selector also connects each such voltage to a master barrier having a voltage limiting zener diode.



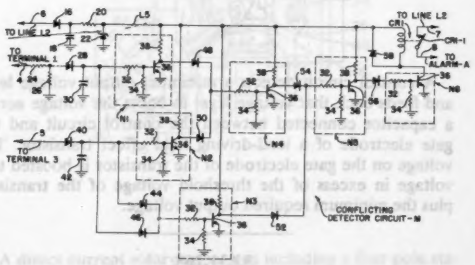
The master barrier's zener diode is bypassed by a controlled rectifier which fires if the last said diode is over driven. In a modification, the one resistor of an individual barrier is replaced by a current limiting impedance consisting of self-biased transistors.

3,631,265

CONFLICTING SIGNAL ERROR DETECTOR FOR PROCESS CONTROL SYSTEM

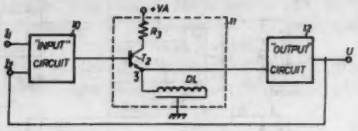
Donald E. Henry, Davenport, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Sept. 27, 1968, Ser. No. 812,483
Int. Cl. H03k 17/26
U.S. Cl. 307—252 B 4 Claims



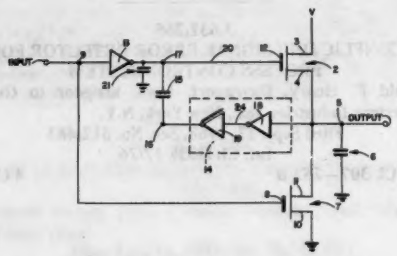
There is disclosed herein an error detection system for developing an error signal when the signal received by the input circuit of a solid-state process control circuit means is in conflict with the signal carried by the output circuit thereof.

3,631,266
DELAY LINE PULSE GENERATOR
Georges Kassabgi, Pregnana Milanese, Milan, Italy, assignor to Honeywell Information Systems Italia S.p.A., Torin, Italy
Filed Feb. 25, 1970, Ser. No. 14,017
Claims priority, application Italy, Feb. 27, 1969, 13384 A/69
Int. Cl. H03k 1/18
U.S. Cl. 307—265 **8 Claims**



A circuit for generating an output pulse of predetermined amplitude and duration in response to an input pulse, wherein the roundtrip time of a wave applied to a short-circuited delay line determines the duration of the output pulse and wherein the output pulse is coupled back to the circuit input to isolate the input and make the duration of the output pulse independent of that of the input pulse.

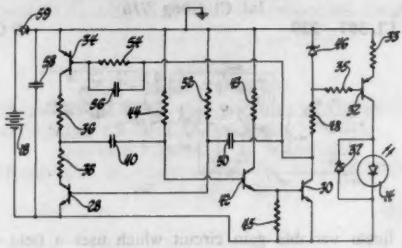
3,631,267
BOOTSTRAP DRIVER WITH FEEDBACK CONTROL CIRCUIT
Gary Lee Heimbigner, Anaheim, Calif., assignor to North American Rockwell Corporation
Filed June 18, 1970, Ser. No. 47,477
Int. Cl. H03k 3/26
U.S. Cl. 307—270 **7 Claims**



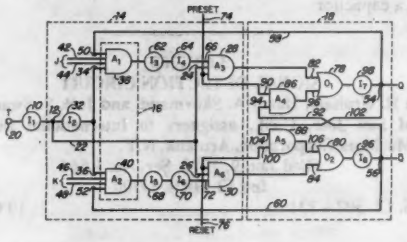
A control circuit detects a minimum output voltage level and feeds back that voltage level to boost the voltage across a capacitor connected between the control circuit and the gate electrode of a load-driving field effect transistor. The voltage on the gate electrode of the transistor is boosted to a voltage in excess of the threshold voltage of the transistor plus the minimum required output voltage.

3,631,268
PULSER FOR INTRUDER DETECTION SYSTEMS
David R. Matthews, Ann Arbor, Mich., assignor to Laser Systems Corporation, Ann Arbor, Mich.
Filed May 8, 1969, Ser. No. 822,900
Int. Cl. H03k 3/10
U.S. Cl. 307—273 **3 Claims**

A multivibrator-type pulse forming circuit designed for asymmetric operation and power conservation. A current-controlling transistor is connected in series with one of the two complementary stages of the pulse-forming circuit to restrict current through the stage when the stage is conductive thereby to conserve power and to permit the use of a short time constant coupling circuit.



3,631,269
DELAY APPARATUS
Joseph E. Monahan, Framingham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 30, 1968, Ser. No. 787,662
Int. Cl. H03k 17/26
U.S. Cl. 307—293 **11 Claims**

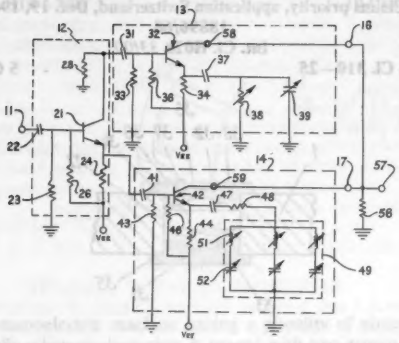


Apparatus is disclosed in an integrated circuit for generating a pulse, adaptable for triggering a complementing bistable circuit, using inverter delay means without capacitive or inductive elements including at least one logic inverter circuit to provide the necessary delay.

3,631,270
ACTIVE ALL-PASS NETWORK FOR PHASE EQUALIZERS
James J. Heinemann, San Jose, Calif., assignor to GTE Automatic Electric Laboratories Incorporated
Filed Dec. 3, 1970, Ser. No. 94,809
Int. Cl. H03k 1/16
U.S. Cl. 307—295 **6 Claims**

An all-pass system particularly adapted for equalizing group delay distortion in wide band communication systems. Two common emitter stages having adjustable resonant circuits are arranged in parallel to receive a single input and to linearly combine the outputs of the stages. One stage is wide

band and the other is frequency selective and the output of the selective stage is twice the amplitude of the wide band



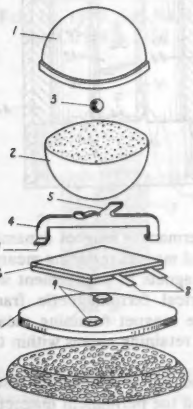
stage and phase inversion is provided such that the outputs of the two stages are 180° apart.

3,631,271

BURGLAR ALARM SWITCH

Tatsuji Shimada, c/o Deiko Electronics Industrial Co. Ltd., No. 25-28, Juso, Higashino-cho, Higashiyodo-gawa-ku, Osaka, Japan

Filed Oct. 22, 1970, Ser. No. 82,967
Claims priority, application Japan, Nov. 27, 1969, 44/095279
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.1 **10 Claims**



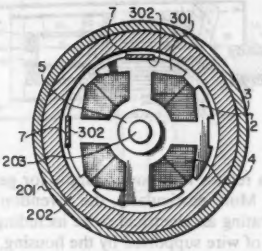
A burglar alarm switch is mounted on an object to be protected. It comprises a vibration producer for converting any tilting movement of the object into vibrations and a piezoelectric element associated therewith for transducing the vibrations into an electric warning voltage.

3,631,272

DC ELECTRIC MOTOR USING HALL ELEMENTS

Tatsuji Shimada, c/0 Daiko Electronics Industrial Co. Ltd., Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 28, 1970, Ser. No. 32,682
Claims priority, application Japan, Apr. 4, 1969, 44/40152
Int. Cl. H02k *37/00*
U.S. Cl. 310—10 **4 Claims**



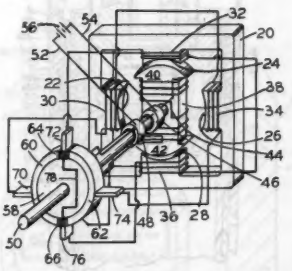
A DC electric motor has a groove formed perpendicular to the rotating direction of a rotor at the center of the peripheral surface of one or more poles of a stator. A plurality of Hall elements are disposed at the center of a substrate which is inserted into said groove.

3,631,273

DIRECT CURRENT ROTARY APPARATUS

Jesse J. Stein, 115 Trinity Pl., Syracuse, N.Y.

Continuation of application Ser. No. 678,730, Oct. 27, 1969, now abandoned. This application Oct. 6, 1969, Ser. No. 866,091
Int. Cl. H02k *37/00*
U.S. Cl. 310—46 **6 Claims**

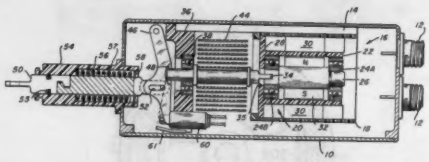


A direct current rotary apparatus including a four pole stator and a two pole rotor rotatable within said stator. The rotor having a commutator switch having two opposed arcuate segments and two sliprings each ring being connected to one of the switch segments and to the rotor winding. Four relatively stationary brushes angularly spaced uniformly about the segments, opposite pairs of brushes being connected to corresponding opposed stator, and coils the commutator having antishorting segments of brush width or greater disposed between the arcuate segments, and connected by a resistance.

3,631,274
PROGRAM SEQUENCE INITIATOR

Bob E. Stauder, 5649 S. New Haven, Tulsa, Okla., and William O. Christianson, 6625 S. 70th East Ave., Tulsa, Okla., assignors to Dorsett Electronics, a Division of La Barge, Inc., Tulsa, Okla.

Filed Apr. 27, 1970, Ser. No. 32,232
Int. Cl. H02k 7/18
U.S. Cl. 310—66 7 Claims

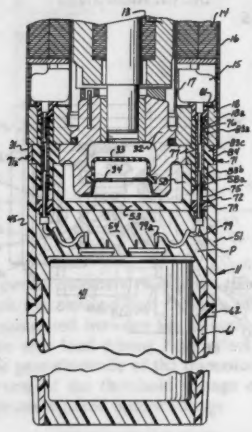


This invention relates to a power supply for generating an electrical pulse. More particularly, the invention is a power supply for generating an electrical pulse including a housing, at least one coil of wire supported by the housing, a magnetic rotor supported by the housing and rotatable relative to the coil, and spring means interconnected to the magnetic rotor and adapted upon unwinding of the spring means to rotate the magnetic rotor relative to the coil to induce a voltage pulse in the coil.

3,631,275
SUBMERSIBLE MOTOR COMPONENTS UNIT FOR A SUBMERSIBLE ELECTRIC MOTOR

Kenneth W. Conrad; Ronald W. Albers, both of Davenport, and Elmer M. Deters, Muscatine, all of Iowa, assignors to Red Jacket Manufacturing Company, Davenport, Iowa

Filed May 20, 1970, Ser. No. 38,975
Int. Cl. H02b 11/00
U.S. Cl. 310—71 9 Claims

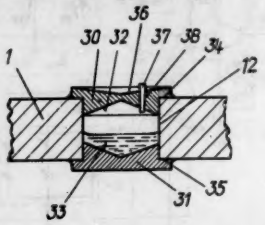


A submersible motor components unit for a submersible electric motor in which the submersible motor has a plug-type disconnect at one end and the motor components unit is detachably mounted on the end of the submersible motor. The submersible motor components unit has a molded plastic outer housing detachably mounted on the motor and filled with a resinous potting material around the motor components to provide a unitary resinous body that encloses the motor components and seals the same from the surrounding medium.

3,631,276
MECHANICAL RESONATOR FOR TIME-MEASURING APPARATUS

Max Hetzel, Bienne, Switzerland, assignor to Centre Electronique Horloger S.A., Brequet-Neuchatel, Switzerland

Filed Dec. 8, 1969, Ser. No. 882,818
Claims priority, application Switzerland, Dec. 19, 1968, 18896/68
Int. Cl. H02k 33/00
U.S. Cl. 310—25 5 Claims

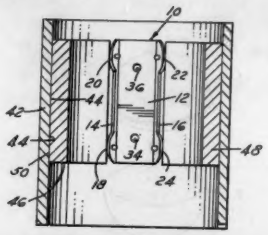


A mechanical resonator for time-measuring apparatus, comprising two branches oscillating in phase opposition and at least one device for the compensation of the variations of the frequency proper of the resonator when the orientation in space of the latter changes, said device comprising a cavity provided in a piece forming part of one of the said branches, and a mass placed in this cavity to move freely in the same, consisting of a viscous liquid filling only a part of the cavity.

3,631,277
STATOR FOR A PERMANENT MAGNET DYNAMOELECTRIC MACHINE INCLUDING NOVEL MAGNET RETAINING MEANS

Russell G. Ferdig, Ypsilanti, and Robert W. Burby, Dexter, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 15, 1970, Ser. No. 98,252
Int. Cl. H02k 21/26
U.S. Cl. 310—154 5 Claims



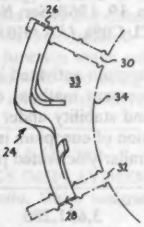
A stator for a permanent magnet dynamoelectric machine in which prestressed magnet retaining means are employed to hold permanent magnets in engagement with the inner surface of a cylindrical ferromagnetic frame. The stresses developed in these magnet retaining means also retain or hold these magnet retaining means within the cylindrical ferromagnetic frame.

There is also disclosed a method for installing the magnet retaining means and the permanent magnets within the cylindrical ferromagnetic frame including positioning a pair of magnet retaining means at opposed positions within the cylindrical ferromagnetic frame, applying a radially outward force on the body portion of the magnet retaining means to rotate permanent magnet engaging tabs toward each other, inserting axially a pair of arcuate permanent magnets within the cylindrical frame, and removing the radially outward force on the body portion of the magnet retaining means so that the tabs rotate outwardly into an engagement with the edges of the arcuate permanent magnets.

3,631,278
FORM-WOUND DYNAMOELECTRIC MACHINE WITH REDUCED COIL DISTORTION

Howard Donald Snively, Schenectady, N.Y., assignor to General Electric Company

Filed Apr. 20, 1970, Ser. No. 30,047
Int. Cl. H02k 3/00
U.S. Cl. 310—208 10 Claims

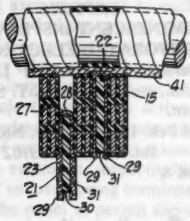


A dynamoelectric machine having a plurality of circumferentially adjacent deep slots is wound with two groups of preformed coils pulled in opposite directions, i.e., a first group of coils having coil sides in one circumferential direction adapted to be radially inner coil sides and a second group of coils formed with coil sides in the particular one circumferential direction adapted to be radially outer coil sides. By placing coils of the first group in the second and third slot positions proceeding in one circumferential direction and coils of the second group in the first and second slot positions proceeding in the other circumferential direction, the machine can be wound without the necessity for raising any previously positioned coil side. When all the slots of the machine are not of equal radial depth, a radially extending step can be provided in radial alignment with the deep slots to provide substantially equal flux carrying cross section throughout the slotted member.

3,631,279
DYNAMOELECTRIC MACHINE BLOCKING MEANS

Alexander E. Bozsvai, Solon, and Harvey A. Trickel, Cleveland, both of Ohio, assignors to The Reliance Electric Company

Filed Feb. 16, 1970, Ser. No. 11,517
Int. Cl. H02k 3/50
U.S. Cl. 310—260 15 Claims



The support for the end turns of windings of a dynamoelectric machine is provided by blocking means which includes both rigid and conformable blocking. In one embodiment the conformable blocking is in a form like felt and is partially wrapped around a block to provide ready insertion of the blocking means between adjacent end turns which extend out of slots in a magnetic core of the dynamoelectric machine. The conformable blocking is initially unimpregnated and later the entire blocking means is dipped in varnish and baked to provide rigid blocking means between adjacent end turns.

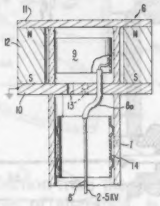
ERRATUM

For Class 313—220 see:
Patent No. 3,631,530

3,631,280
IONIC VACUUM PUMP INCORPORATING AN ION TRAP

Nathan D. Levin, Los Altos Hills; Andreas Niewold, and Stephen D. Sparks, both of Sunnyvale, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Oct. 6, 1969, Ser. No. 864,064
Int. Cl. H01j 7/16
U.S. Cl. 313—7 5 Claims

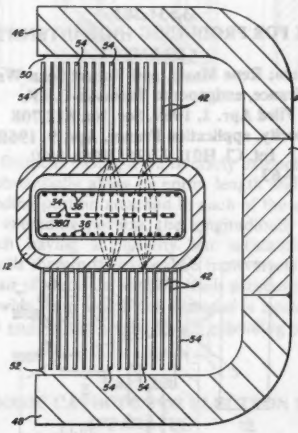


An ionic vacuum pump, which is continuously operated to maintain a vacuum within an image tube, is located at the end of a cylindrical tubulation connected to the envelope of the tube. An ion trap comprises a cylindrical cathode sleeve in contact with the walls of the tubulation and a rod-shaped anode electrode, which is connected to the anode of the pump and extends from the pump into the envelope of the tube where it connects to one of the tube electrodes, which is in turn connected to a 2.5 kv. DC source. The radial electric field between the anode and cathode of the ion trap drives positive ions escaping from the pump toward the cathode of the trap where they are collected and thus prevented from entering the tube.

3,631,281
MAGNETIC FIELD EXTENDERS

Jacob A. Randmer, Wilton, Conn., assignor to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed Apr. 30, 1970, Ser. No. 33,450
Int. Cl. H01j 7/24, 1/50
U.S. Cl. 313—11 7 Claims

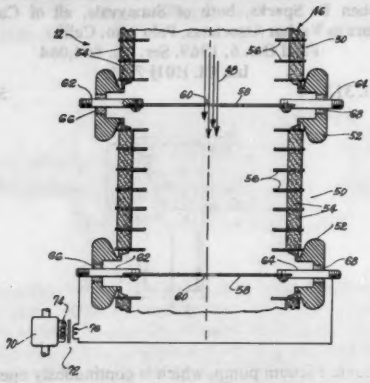


An electron discharge device of the magnetic beam type which employs magnetic field extending means enabling the device to be provided with air-cooling features while reducing the magnetic gap.

3,631,282
ACCELERATING TUBE WITH HEATING MEANS

Raymond G. Herb, Madison, Wis., assignor to National Electrostatics Corp., Middleton, Wis.

Filed Jan. 23, 1969, Ser. No. 793,333
Int. Cl. H01j 7/24; H05h 5/02
U.S. Cl. 313—15 20 Claims

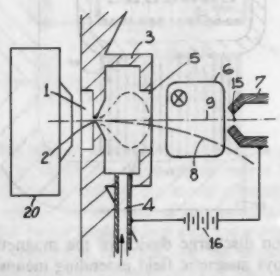


The accelerating tube of the present invention is provided with means for continuously heating the tube while it is in operation. This has the surprising effect of greatly increasing the ability of the tube to withstand high voltages. Thus, an increased operating voltage may be employed when the tube is heated. The heating of the tube drives off condensed gases from the interior surfaces of the tube, while also preventing any condensation of residual gases upon such surfaces. Various means may be provided to heat the tube. It is particularly advantageous to subdivide the tube into tubular sections with separator electrodes or diaphragms therebetween. The ion beam passes within the tube through apertures in the separators. It is preferred to heat the separators by causing electrical currents to pass through the separators. The electrical currents are preferably supplied by a series of generators driven by an insulating shaft. Heat may also be supplied externally to the accelerating tube, by means of heating coils or lamps. Another arrangement is to heat the entire tank in which the tube is enclosed.

3,631,283
DEVICE FOR PRODUCING HIGH INTENSITY ION BEAMS

Guy Gautherin; Rene Masic, and Robert Jean Warnecke, all of Paris, France, assignors to Thomson-C.S.F.

Filed Apr. 2, 1969, Ser. No. 812,708
Claims priority, application France, Apr. 9, 1968, 147478
Int. Cl. H01j 17/26; H05h 1/00
U.S. Cl. 313—63 6 Claims



A gas or vapor is ionized by passing it through a plasma jet, hydrogen plasma for example; the ionization takes place in an enclosure, the wall of which either contains devices for injecting the gas or vapor to be ionized, or devices for vaporizing by local heating solid samples of the same substance.

3,631,284
RED-EMITTING MATERIAL FOR CATHODOLUMINESCENT SCREENS

Thomas E. Sisneros, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

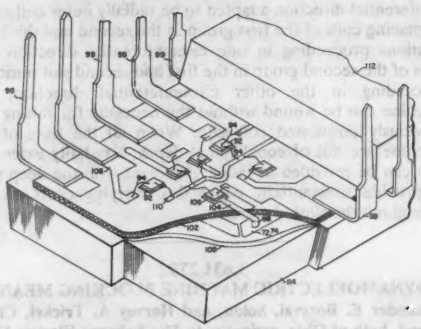
Filed Jan. 19, 1968, Ser. No. 701,040
Int. Cl. C09k 1/04; H01j 29/20
U.S. Cl. 313—92 2 Claims

A phosphor of europium activated lithium indate provides a red-emitting luminescent material of high brightness and good chromaticity and stability under electron beam excitation. The concentration of europium is relatively low in comparison with other similarly activated phosphors.

3,631,285
ELECTROLUMINESCENT DISPLAYS

Risto J. Laisi, Amherst; Wayne F. Galusha, Reeds Ferry, and Alfred J. MacIntyre, Nashua, all of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 4, 1970, Ser. No. 16,498
Int. Cl. H01j 1/62
U.S. Cl. 313—108 12 Claims

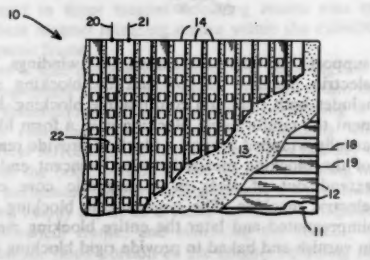


An electroluminescent display device is provided in which the character electrodes, the common electrode, the dielectric and phosphor layers, the filter, the interconnecting leads and the semiconductor chips form an integral structure.

3,631,286
ELECTROLUMINESCENT DISPLAY DEVICE WITH PERFORATED ELECTRODES

Donald E. Anderson, and Richard L. Swisher, both of Northfield, Minn., assignors to G. T. Schjeldahl Company, Northfield, Minn.

Filed Feb. 16, 1970, Ser. No. 11,735
Int. Cl. H05b 33/02
U.S. Cl. 313—108 A 4 Claims



Electroluminescent device means comprising a base substrate member having a plurality of individual electrically

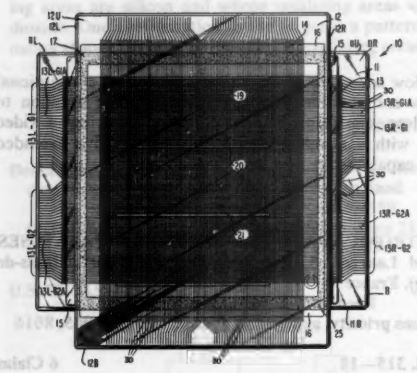
conductive drive lines arranged in integral rows upon the surface of said substrate, a film of an electroluminescent phosphor disposed on the surface of said rows of electrically conductive drive lines, a plurality of individual electrically conductive drive lines arranged in integral columns upon the surface of said phosphor and orthogonally overlying said rows at certain mutual junction areas; and means coupling a source of electrical energy to each of said electrically conductive drive lines in said rows and columns; said electrically conductive columns having isolated perforate openings formed therein at said junction areas, said openings having a large peripheral to area ratio and being disposed along said conductors in enclosed relationship therewithin.

3,631,287

GAS DISCHARGE DISPLAY/MEMORY PANEL

Harold J. Hoehn, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Sept. 9, 1969, Ser. No. 856,373
Int. Cl. H01j *61/30*
U.S. Cl. 313—109.5 **4 Claims**



There is disclosed a gas discharge panel having a pair of elongated rectangular glass plates, each carrying on one surface a conductor array consisting of spaced parallel conductors running in the long direction of the plate and a dielectric coating on selected portions of the conductors of the array. The plates have long axes transverse to each other and are spacedly joined and sealed along an endless seal line defining a thin gas chamber in an active panel area, the seal being substantially along the edges of the long sides of the plates, the plates being of a length sufficient such that both lateral ends of the plates project beyond the active panel area and beyond the long side edges of the opposite plate member. Alternate conductors of each array are extended toward the edge of one side edge extension, respectively, the ends of alternate conductors of an array being terminated substantially short of the edge of the panel to permit slip-on or edge connectors to be applied to the conductors which do extend to the edge of the plates. Consult the specification for other features and details.

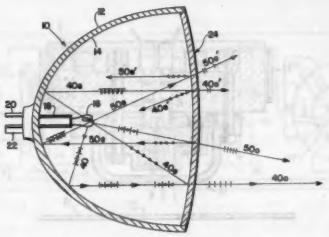
3,631,288

SIMPLIFIED POLARIZED LIGHT PROJECTION ASSEMBLY

Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 23, 1970, Ser. No. 5,194
Int. Cl. H01j *5/16*
U.S. Cl. 313—112 **8 Claims**

An improved assembly for projecting polarized light uses a concave reflecting polarizer which is confocal with a concave metal reflector having a light source at its focus. Light possessing a preferred polarization azimuth is transmitted by the polarizer. Light possessing the orthogonal polarization azimuth is reflected back by the polarizer and circulates between the reflector and the polarizer. Its polarization is altered slightly by reflection from the metal. A small fraction, related to the degree of alteration, is transmitted by the polarizer. After several traverses a significant portion of the orthogonal polarization component is altered and transmitted through the polarizer.

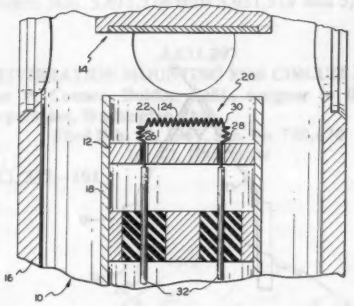


3,631,289

X-RAY FILAMENT WITH BALANCED EMISSION

John T. Perry, Westchester, and Robert M. Cooney, Chicago, both of Ill., assignors to Picker Corporation, White Plains, N.Y.

Filed May 23, 1969, Ser. No. 827,203
Int. Cl. H01j *35/08*
U.S. Cl. 313—330 **4 Claims**



An X-ray filament having a transversely extending portion with coils substantially along its entire length and a longitudinally extending portion attached to each of the ends of the transversely extending portion, the longitudinally extending portions each having a plurality but substantially lesser number of coils therein than does the transversely extending portion. A pair of electrical support leads substantially heavier than the wire from which the filament is made are connected to the ends of the longitudinally extending portions.

3,631,290

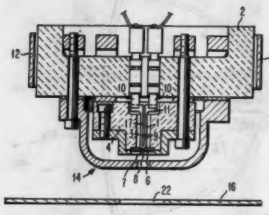
THERMIONIC CATHODE FOR ELECTRON BEAM APPARATUS

Karl H. Loeffler, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 17, 1970, Ser. No. 64,539
Int. Cl. H01j *1/15, 19/08, 1/14*
U.S. Cl. 313—341 **18 Claims**

A thermionic cathode comprising a lanthanum hexaboride (LaB_6) emitter and an emission current-intercepting plate

made of rhenium containing an aperture disposed adjacent the emitter. The separation between the emitter and plate is set as small as possible without physical contact between them, typically 0.1 mm. The beam emitted through the aperture has high brightness and low energy spread. To prevent corrosion of the emitter it is housed in a cavity which is exposed to the vacuum of the apparatus only through the aperture.

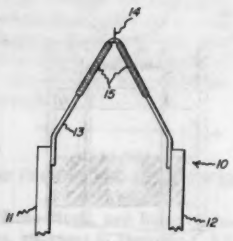


3,631,291

FIELD EMISSION CATHODE WITH METALLIC BORIDE COATING

Louis J. Favreau, Elnora, N.Y., assignor to General Electric Company

Filed Apr. 30, 1969, Ser. No. 820,564
Int. Cl. H01j *1/14, 19/06;* **H01k** *1/04*
U.S. Cl. 313—345 **7 Claims**



A field emission cathode comprises a hairpin rhenium filament coated with lanthanum boride and with a fine tungsten tip attached to the rhenium filament serves as an efficient source of electrons. The presence of free lanthanum atoms at the tungsten surface lowers the work function and enhances the field emission from the tungsten tip.

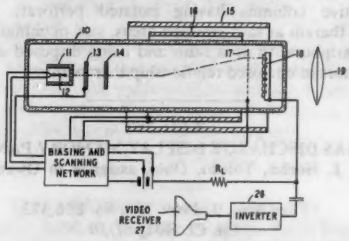
3,631,292

IMAGE STORAGE TUBE

Merton H. Crowell, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Sept. 23, 1969, Ser. No. 860,271
Int. Cl. H01j *31/26*
U.S. Cl. 315—10 **16 Claims**

Bandwidth limitations in some video systems (e.g., those employing telephone transmission lines) prohibit the transmission of high-resolution video with the normal frame interval. One proposal for overcoming this is to extend the frame period. Although moving subjects cannot be televised in this way the proposal is quite adequate for transmitting documents. The convenient way to implement this proposal is to use a slow scan rate in the camera. However, conventional cameras are not made with sufficient storage duration to allow slow scan rates. The specification describes a video camera with a novel mode of operation to give extended storage capability.

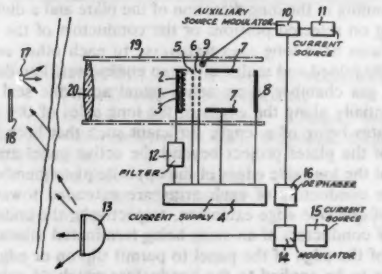


3,631,293

ELECTRONIC IMAGE TRANSFORMER APPARATUSES

Bernard Laurent, 5, rue Jules Ferry, Clamart (Hauts-de-Seine), France

Filed Mar. 4, 1966, Ser. No. 534,962
Claims priority, application France, Mar. 5, 1965, 8016
Int. Cl. H01j *31/48*
U.S. Cl. 315—11 **6 Claims**



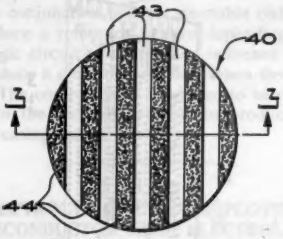
An image-transforming apparatus operating by means of electron radiations includes a first modulator of the electron radiation, a projector for lighting the field of the apparatus, a second modulator with a frequency different from that of the first modulator for the light of the projector, and an electric filter which prevents the passage of the electron current at the frequency of the first modulator.

3,631,294

ELECTRONIC STORAGE TUBE UTILIZING A TARGET COMPRISING BOTH SILICON AND SILICON DIOXIDE AREAS

Steven R. Hofstein, Princeton, N.J., assignor to Princeton Electronic Products, Inc., Princeton, N.J.

Filed July 10, 1969, Ser. No. 840,698
Int. Cl. H01j *29/70*
U.S. Cl. 315—12 23 Claims



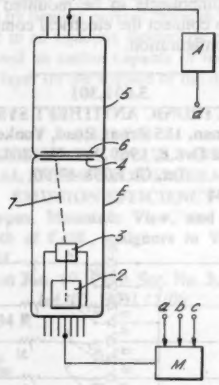
An electronic storage tube having a target whose conducting areas are silicon and whose insulating areas are silicon dioxide. One configuration of the target is a pattern of alternating strips of conducting areas and insulating areas.

3,631,295

METHOD AND APPARATUS FOR STORING INFORMATION

Derek Pooley, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed June 16, 1969, Ser. No. 833,550
Claims priority, application Great Britain, June 21, 1968, June 5, 1969, 29,845/68, 28605/69
Int. Cl. H01j *29/50*
U.S. Cl. 315—13 ST 21 Claims



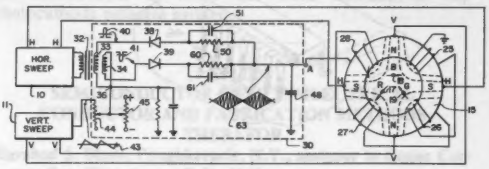
Information is stored, erased and read in an electron-luminescent phosphor by electron beams of respectively medium, high and low intensity. The medium intensity beam produces radiation damage in the phosphor which quenches its subsequent luminescence when irradiated with the reading low-intensity beam. The high-intensity beam heats the crystal and anneals out damaged areas thus restoring full (or nearly full) luminescence under the reading beam. In application to a storage tube the whole of the phosphor surface can be made to luminesce (with bright and quenched regions according to the information "written" in) by flooding the whole surface with ultraviolet light.

3,631,296

TELEVISION DEFLECTION SYSTEM

Homah C. Collie, Jr., Long Grove, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 10, 1969, Ser. No. 883,765
Int. Cl. H01j *29/50*
U.S. Cl. 315—13 9 Claims



A deflection system for use with a color television multibeam cathode-ray tube utilizes a toroid deflection yoke with the distribution of the vertical and horizontal deflection windings being such as to provide a uniform deflection field within the toroid. An additional set of four series-connected, oppositely wound, correction windings are wound on different quadrants of the toroid yoke, and a correction current is applied to the correction windings in the form of a current corresponding to the horizontal deflection signal modulated by the vertical deflection signal for correcting misconvergence of the beams.

ERRATA

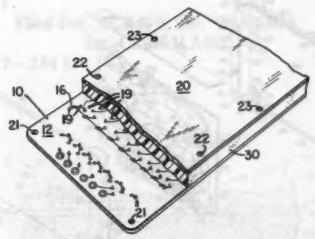
For Classes 315—27, 315—34, 315—83, 315—94, 315—166, 315—209 and 315—241 see: Patent Nos. 3,631,314 thru 3,631,319 and 3,631,531

3,631,297

ANTIVIBRATION MOUNTING FOR CIRCUIT BOARDS

Arthur P. Conner, Dublin, Calif., assignor to Dynalectron Corporation, Washington, D.C.

Filed Feb. 12, 1969, Ser. No. 798,670
Int. Cl. H05k *1/04*
U.S. Cl. 317—101 7 Claims



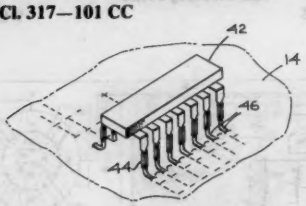
A mounting for a large printed circuit board having a widespread number of short projections extending out from a surface to be supported. A slice of easily impressionable rigid foam plastic is sandwiched between the printed circuit board and a base of rigid metal. The projections are impressed into the plastic foam to provide retaining cavities, and a series of screws extend through said board at a margin closely adjacent its edge, extending through the foam and into the base.

3,631,298

WOVEN INTERCONNECTION STRUCTURE

John S. Davis, Glendale, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Oct. 24, 1969, Ser. No. 869,029
Int. Cl. H05k *1/18*
U.S. Cl. 317—101 CC 11 Claims



A structure for providing circuit interconnections by means of a woven fabric. Special elements and techniques are employed to establish the individual wire-to-terminal or wire-to-wire connections within the structure and also those required for the attachment to external circuit modules. These external circuit modules have perpendicularly depending output terminals and are connected to the woven structure by providing corresponding float wire patterns for each module, the float wires being cut and bent to form aligned mating terminals for receiving the module terminals. In a particular embodiment connection to the external components is accomplished by providing the float wires as hollow tubular members within which the module terminals are respectively inserted.

ERRATUM

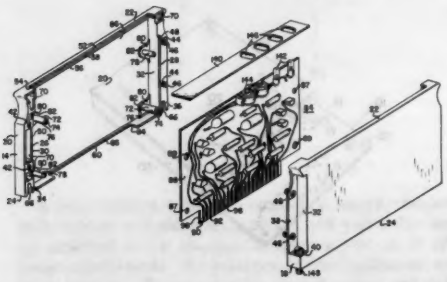
For Class 317—80 see:
Patent No. 3,631,532

3,631,299

PRINTED CIRCUIT BOARD MODULE AND SUPPORT WITH CIRCUIT BOARD SUPPORTING POSTS

Charles F. Meyer, Wauwatosa; Clarence N. Groth, Mequon, and Kenneth L. Paape, Mequon, all of Wis., assignors to Square D Company, Park Ridge, Ill.

Filed May 21, 1970, Ser. No. 39,485
Int. Cl. H05k *5/02*; H02b *1/10*
U.S. Cl. 317—120 12 Claims



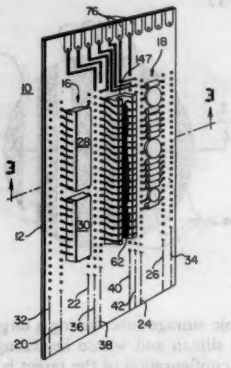
A printed circuit board module including a housing which is formed by two substantially identical molded parts that are secured to each other to provide an enclosure for one or two printed circuit boards. The two molded parts each have female- and male-type posts extending through openings in the printed circuit boards. The posts are arranged so the male posts on the respective parts telescope into the female posts to position the printed circuit boards within the interior of a housing provided by the two parts. The housing positions one of the printed circuit boards so portions of the board may be plugged into a female receptacle and includes means for guiding the housing relative to the receptacle.

3,631,300

CIRCUIT DISTRIBUTION BOARD WITH WIRE RECEIVING CHANNEL

Jim V. Humble, Granada Hills, Calif., assignor to Donald Stewart

Filed July 29, 1970, Ser. No. 59,187
Int. Cl. H02b *1/20*
U.S. Cl. 317—122 10 Claims



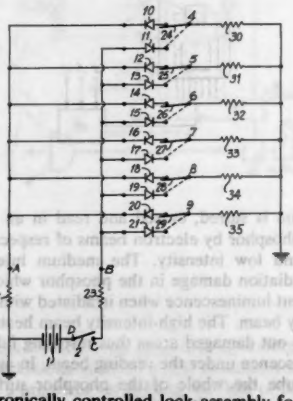
A circuit distribution board is disclosed which includes a support board made from an electrically insulating material and which has a first side and a second side. Mounting means are provided for mounting electrical components on the support board in component columns on the first side of the support board. The mounting means includes a plurality of mounting holes through the support board, with each of the mounting holes being adapted to receive the electrical leads of any electrical components to be mounted on the support board. A channel member is secured to the support board adjacent to the component columns. The channel member is adapted to receive and protect connecting wires for electrically connecting predetermined ones of the electrical leads of any electrical components to be mounted on the support board in order to connect the electrical components into any desired circuit configuration.

3,631,301

ELECTRONIC ANTITHEFT SYSTEM

Gerald M. Goldman, 185 Bronx Road, Yonkers, N.Y.

Filed Oct. 8, 1969, Ser. No. 864,801
Int. Cl. E05b *49/00*
U.S. Cl. 317—134 1 Claim



An electronically controlled lock assembly for a chamber door adapted to afford access to the chamber only to those who carry a passkey having a predetermined profile. Mounted on the door is a keyway having a group of electric

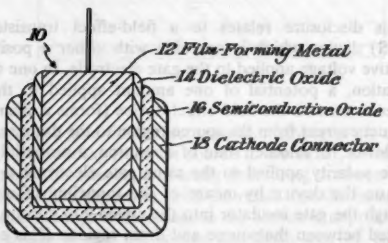
switches therein which are selectively actuated by the inserted passkey in accordance with the profile thereof. The door is provided with a signal-operated locking mechanism which is activated to release the door lock only when an output signal is applied thereto. Disposed within the chamber is a logic circuit which is connected to the group of switches in the keyway to establish an electrical test pattern depending on which of the switches is activated and hence on the profile of the passkey. The logic circuit includes a switching panel operating in conjunction with an insertable coded reference key to produce a reference pattern depending on the key code, the logic circuit comparing the reference and test patterns to produce a control signal only when the patterns are coincident. The control signal is applied to an output circuit connected to the locking assembly to produce an output signal for releasing the lock.

3,631,302

ELECTROLYTIC DEVICE EMPLOYING SEMICONDUCTOR OXIDE ELECTROLYTE

Preston Robinson, Bulkley St., Williamstown, Mass.

Filed Oct. 14, 1968, Ser. No. 767,516
Int. Cl. H01g *9/04*
U.S. Cl. 317—230 **3 Claims**



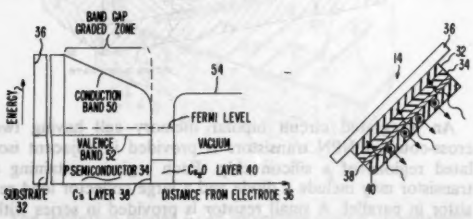
A solid electrolyte condenser is produced by competing electrolytic reactions that produce a dielectric oxide film on an anode and an outer layer of semiconductive oxide or oxides on said film by passing current through said anode, and a suitable cathode in an aqueous electrolyte containing a film-forming anion; and an cation capable of being oxidized to a semiconductive layer on the surface of the dielectric film.

3,631,303

III-V CATHODES HAVING A BUILT-IN GRADIENT OF POTENTIAL ENERGY FOR INCREASING THE EMISSION EFFICIENCY

George A. Antypas, Mountain View, and Ronald L. Bell, Woodside, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Jan. 19, 1970, Ser. No. 3,948
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 R **8 Claims**



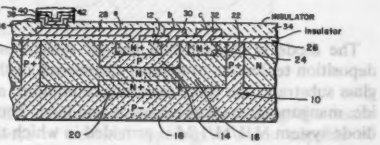
A gradient of potential energy was established in the active layer of a III-V photocathode for enhancing free electron diffusion toward the emissive surface of the cathode. The energy gradient was provided by decreasing the bandgap energy across the active layer which caused the conduction level to slope downwards from the substrate to the emissive surface through progressive changes in the concentration of the III-V elements forming the active layer. Alternatively, a nonuniform concentration of active layer dopant—heavy on the substrate side and light on the emissive side of the active layer—established a built-in electric field across the active layer. The graded bandgap and/or dopant levels promote free electron drift toward the outer surface of the active layer. Layers of cesium, cesium oxide, or both, were provided over the active layer to lower the work function of the photocathode emissive surface.

3,631,304

SEMICONDUCTOR DEVICE, ELECTRICAL CONDUCTOR AND FABRICATION METHODS THEREFOR

Harshad J. Bhatt, Poughkeepsie, N.Y., assignor to Cogar Corporation, Wappingers Falls, N.Y.

Filed May 26, 1970, Ser. No. 40,635
Int. Cl. H01l *3/00*
U.S. Cl. 317—234 L **31 Claims**



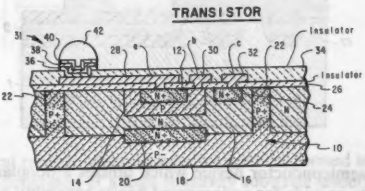
This disclosure is directed to an improved semiconductor device, electrical conductor, thin-film conductor, and fabrication methods therefor. An aluminum-aluminum oxide alloy conductor is disclosed which has a high resistance to electromigration and hence, a conductor lifetime greater by at least a factor of 10 than unalloyed aluminum conductors. Semiconductor device utilizing this aluminum alloy in the thin-film conductive stripes interconnecting different conductivity regions or devices located in the semiconductor substrate are significantly improved and more reliable.

3,631,305

SEMICONDUCTOR DEVICE AND ELECTRICAL CONDUCTOR

Harshad J. Bhatt, and James W. Tuttle, both of Wappingers Falls, N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.

Filed Dec. 17, 1970, Ser. No. 99,036
Int. Cl. H01l *3/00*
U.S. Cl. 317—234 L **18 Claims**

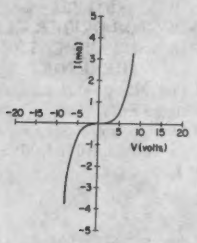


This disclosure is directed to an improved semiconductor device, electrical conductor, thin-film conductor, alloy and fabrication methods therefor. An aluminum-oxide-copper alloy conductor is disclosed which has a high resistance to electromigration and hence, a conductor lifetime greater by at least a factor of 10 than unalloyed aluminum conductors. Semiconductor devices utilizing this aluminum alloy in the thin-film conductive stripes interconnecting different conductivity regions or devices located in the semiconductor substrate are significantly improved and more reliable.

3,631,306
SCHOTTKY-EMISSION THIN-FILM VARISTOR DIODE FORMED OF Al/Al_2O_3/MN/MN_xO_y/Pb AND A METHOD OF FABRICATING THE DIODE

Robert D. Hitchcock, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 25, 1969, Ser. No. 810,267
Int. Cl. H01l 9/00, 9/10
U.S. Cl. 317—234 7 Claims

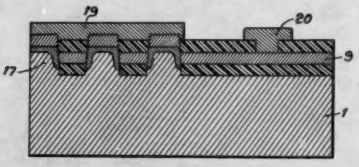


The diode is formed in a bell-jar system using a vapor-deposition technique to deposit a sandwich of thin-films on a glass substrate, the films including aluminum, aluminum oxide, manganese, manganese oxide and lead. Thus a five-layer diode system M/1/M/1/M is provided in which the 1/M/1 is a barrier member formed of the oxides and the manganese and having a thickness about 200 A. The electrodes are the aluminum and lead, i.e., the metals "M" which sandwich the barrier 1/M/1. Critically, the manganese oxide film is formed by a two-step process in which the deposited manganese film first is permitted to oxidize slowly, preferably, in the residual air of a reduced atmosphere of about $2–8\times10^{-5}$ torr. This oxidizing exposure, which may last for about 5 minutes, is followed by a relatively rapid oxidation of the manganese at atmosphere pressure.

3,631,307
SEMICONDUCTOR STRUCTURES HAVING IMPROVED HIGH-FREQUENCY RESPONSE AND POWER DISSIPATION CAPABILITIES

Walter E. Naugler, Jr., Redondo Beach, Calif., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 13, 1970, Ser. No. 11,243
Int. Cl. H01l 11/06
U.S. Cl. 317—235 R 6 Claims

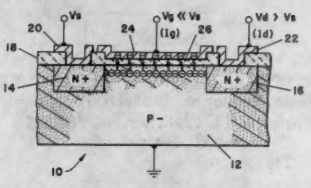


A semiconductor device which utilizes a nonplanar structure to provide for an increased power capability and an improved high-frequency performance. A multiplicity of emitter regions are isolated on plateaus wherein each plateau is surrounded by a moat. A base region forms a PN junction with each emitter region, which junction extends to the edge of the moat. The base region has a portion which extends toward the base of the moat within the periphery of the plateau. An insulated base electrode is placed within the moat so as to make contact with the base region beneath the surface of the device, while contact is made to the emitter region by a metal layer extending over a portion of the device surface. This configuration provides for an increased emitter periphery for a given base area and thus improved high-frequency performance and power capability.

3,631,308
MOS SEMICONDUCTOR DEVICE OPERABLE WITH A POSITIVE OR NEGATIVE VOLTAGE ON THE GATE ELECTRODE AND METHOD THEREFOR

Walter F. Krolikowski, Hopewell Junction, N.Y., assignor to Cogar Corporation, Wappingers Falls, N.Y.

Filed June 19, 1970, Ser. No. 47,773
Int. Cl. H01l 11/14
U.S. Cl. 317—235 8 Claims

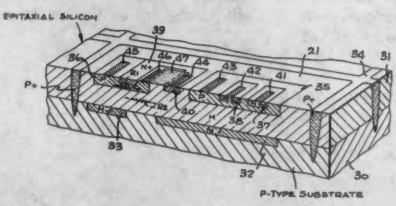


This disclosure relates to a field-effect transistor-type (MOS) device which is operable with either a positive or negative voltage applied to the gate electrode. In one state of operation, a potential of one amount applied to the gate serves to turn on the field-effect device (forms a channel) to conduct current from the source region to the drain region of the device. In another state of operation, a potential of opposite polarity applied to the same gate electrode serves to turn on the device by means of the tunneling of electrons through the gate insulator into the channel or substrate area located between the source and drain regions. This electron tunneling effect occurs due to the thinness of the insulator layer located between the gate electrode and the semiconductor substrate surface. This latter state of operation provides very fast FET action.

3,631,309
INTEGRATED CIRCUIT BIPOLAR MEMORY CELL

Charles Frank Myers, Scottsdale, Ariz., assignor to Semiconductor Electronic Memories, Inc., Phoenix, Ariz.

Filed July 23, 1970, Ser. No. 57,500
Int. Cl. H01l 19/00
U.S. Cl. 317—235 R 10 Claims



An integrated circuit bipolar memory cell having two cross-coupled NPN transistors is provided in adjacent isolated regions of a silicon chip. Each region containing a transistor may include a diode and a large collector load resistor in parallel. A small resistor is provided in series with the diode, either in the same region or a separately isolated region. If in the same region, the small resistor may be included in the diode branch that is in parallel with the large resistor or in series between the cathode region of the diode and on N+ collector contact of the transistor. The base of the transistor and the anode of the diode are formed by diffusion of P-type impurities in an N-type film which serves as a col-

lector region. While two emitters are diffused into the base region of the transistor, the same diffusant is used to form an N+ region across the anode region of the diode to form the large resistor as a thin channel for current conduction from the anode to the N+ region of the collector. The small resistor is formed in the bulk material of the silicon chip either between the cathode region of the diode and the collector region or in a separately isolated region.

3,631,310

INSULATED GATE FIELD EFFECT TRANSISTORS

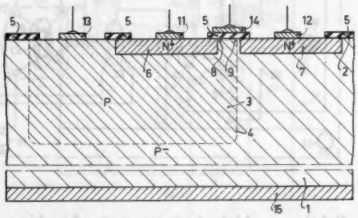
Mukunda Behari Das, Thornton Heath, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1967, Ser. No. 688,227

Claims priority, application Great Britain, Dec. 13, 1966, 55,813/66

Int. Cl. H01l *7/14, 11/00*

U.S. Cl. 317—235 R **9 Claims**



An insulated gate field effect transistor having in the channel region extending from the source to the drain, at least to the depth of the source, a laterally decreasing concentration of substrate-type impurities, with the result that the resistivity of the channel region decreases as the source is approached. An advantage is that the source and drain may be closely spaced while avoiding punchthrough at the usual drain source voltage.

3,631,311

SEMICONDUCTOR CIRCUIT ARRANGEMENT WITH INTEGRATED BASE LEAKAGE RESISTANCE

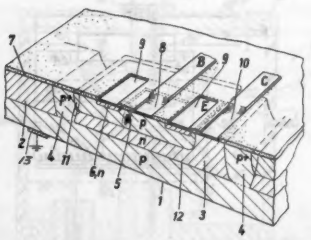
Reiner Engbert, Talheim, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany

Filed Mar. 18, 1969, Ser. No. 808,153

Claims priority, application Germany, Mar. 26, 1968, P 17 64 048.1

Int. Cl. H01l *1/24, 19/00*

U.S. Cl. 317—235 R **6 Claims**



The invention relates to an integrated circuit arrangement comprising a semiconductor body having regions of a first type of conductivity separated by zones of a second type of conductivity. One or more of the regions serves as the collector region of a transistor, the base region thereof being let into the collector region and the emitter region being let into the base region. A separating zone overlaps a portion of the collector region at the semiconductor body surface and extends into the base region whereby a base leakage resistance for the transistor is provided by the bulk resistance between the contact to the separating zone and the base contact.

3,631,312

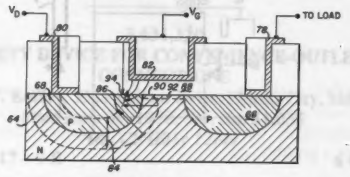
HIGH-VOLTAGE MOS TRANSISTOR METHOD AND APPARATUS

Kenneth J. Moyle, Altos Hills, and Lee P. Madden, Sunnyvale, both of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed May 15, 1969, Ser. No. 824,878

Int. Cl. H01l *11/14*

U.S. Cl. 317—235 **6 Claims**



An MIS FET device and method of making the same wherein a device of nominal topology is made capable of sustaining drain to source potentials substantially higher than the normal breakdown potentials of prior art devices. The present invention is constructed with linearly graded PN junctions and the diffusion profile, as related to the geometry of the gate, is such that the junction depletion layer will extend into the drain region to a point under the thick field oxide so that a critical electric field is not produced in the thin gate oxide causing rupture thereof.

3,631,313

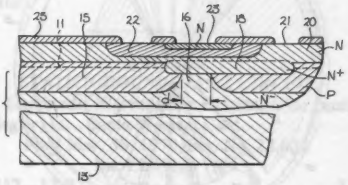
RESISTOR FOR INTEGRATED CIRCUIT

Gordon E. Moore, Los Altos Hills, Calif., assignor to Intel Corporation, Mountain View, Calif.

Filed Nov. 6, 1969, Ser. No. 874,529

Int. Cl. H01l *19/00*

U.S. Cl. 317—235 **9 Claims**

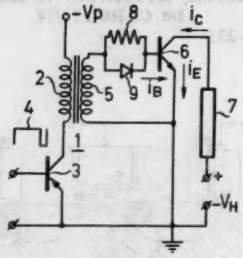


Electrical resistor of semiconductor material formed in the thickness dimension of a high-resistivity substrate underlying an epitaxial layer of the same conductivity-type. A region of the opposite conductivity-type in the substrate, contiguous with the epitaxial layer, extends laterally across all but a predetermined area of the substrate in conjunction with the resistivity of the substrate material determining the resistance value of the resistor. Semiconductor devices and other circuit elements may be formed in the epitaxial layer in accordance with known techniques, the resistor being in series with any desired ones of the additional elements.

3,631,314
CIRCUIT ARRANGEMENT COMPRISING A HIGH-VOLTAGE TRANSISTOR

Wilhelmus Theodorus Hendrikus Hetterscheid, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 14, 1968, Ser. No. 737,009
Claims priority, application Netherlands, June 17, 1967, 6708465
Int. Cl. H01j *29/76*
U.S. Cl. 315—27 TD 12 Claims

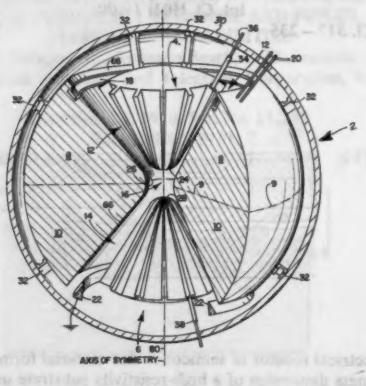


A circuit for increasing the speed of collector current reduction of a high-voltage transistor, in which an impedance is connected in series with the base to restrict variation in reverse base current. The specification discloses embodiments in which the impedance is a parallel circuit of a resistor and diode connected in the pass direction of base-emitter current, and in which the impedance is a coil.

3,631,315
BROADBAND TRAVELING WAVE DEVICE HAVING A LOGARITHMICALLY VARYING BIDIMENSIONAL INTERACTION SPACE

John M. Osepchuk, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 20, 1969, Ser. No. 867,752
Int. Cl. H01j *25/34*
U.S. Cl. 315—39.3 15 Claims

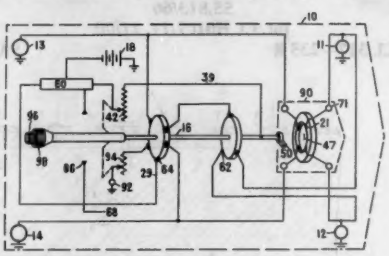


An annular electron beam interacts with a slow wave structure having a periodicity in a specified circumferential direction and a substantially logarithmically continuously scaled or periodic characteristic in a radial direction. The electron stream is translated along a helical path bounded by conical members emanating from a common point of origin and the interaction of the electrons and circuit waves is generally in a transverse reentrant direction with suitable spatial harmonics. Elements of both the "O" and "M" type electron stream interaction coexist with appropriate adjustments of the DC fields in the bidimensional interaction space. An extremely wide bandwidth of as high as a decade for microwave frequency amplifiers as well as oscillators in either the forward or backward wave modes is provided with the disclosed structure.

3,631,316
SYSTEM FOR LIGHTING A PARKED VEHICLE

Hans A. Eckhardt, 55 Crescent Bend, Allendale, N.J.

Filed Mar. 4, 1969, Ser. No. 804,235
Int. Cl. B60q *1/48*
U.S. Cl. 315—83 4 Claims

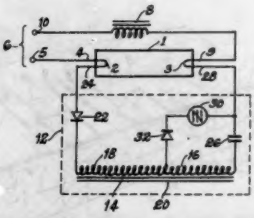


For lighting a vehicle during periods of parking, the vehicle has a first circuit from a battery through an adjustable resistance and a warning switch coupled to the vehicle's light control, alternately to the vehicle's tail side and parking lights. A second circuit leads from the battery through the light control separately to the tail side and parking lights. In a warning position of the light control, the first circuit becomes functional and the lights can be turned on and off alternately by turning the warning switch, the brightness being adjusted by turning the light control's outer ring which is coupled with the adjustable resistance. The warning switch closes the first circuit alternately to tail side or parking lights and simultaneously to individual control lights which are correspondingly positioned in a scaled-down symbol of the car.

3,631,317
SYSTEM FOR LIGHTING A FLUORESCENT LAMP

Masayoshi Miyajima, Kyoto, Japan, assignor to Kuroi Electric Industrial Company, Kyoto, Japan

Filed Jan. 16, 1970, Ser. No. 3,367
Int. Cl. H05b *39/00*
U.S. Cl. 315—94 4 Claims



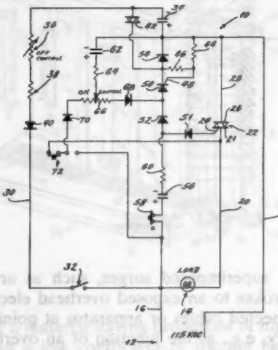
A system for instantaneously lighting a fluorescent lamp is disclosed which includes a capacitor, a pulse transformer having primary and secondary windings, and a diode and silicon symmetrical switch which are connected in parallel with said primary winding and said capacitor. The said primary winding, diode, capacitor and silicon symmetrical switch form an oscillatory circuit for applying a unidirectional pulse

series across the fluorescent lamp, thereby instantaneously lighting the lamp. The circuit is composed entirely of components of a small size, facilitating the production of miniature fluorescent lamp appliances.

3,631,318
SOLID-STATE FLASHER

Bobby Gene Hubbard, Cairo, Ill., assignor to E.D.I. Inc. Cairo, Ill.

Filed Aug. 25, 1969, Ser. No. 852,801
Int. Cl. H05b *37/02*
U.S. Cl. 315—209 R **18 Claims**

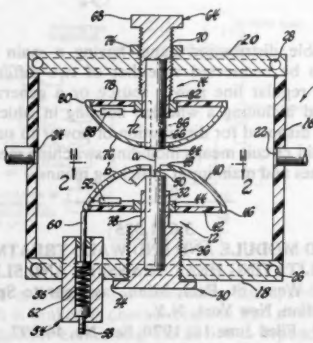


A solid-state flasher circuit for controlling the flashing of electric signs, warning lights and other similar devices, said circuit having no movable parts or wear components. The subject circuit is a relatively versatile control which includes separate means adjustable to control the flasher on time, the flasher off time, the flashing frequency, whether the flasher is to be operated at full or half-wave power, it always initiates energizing of the flasher device under minimum power conditions, and it also includes means for operating as a time delay means.

3,631,319
TRIGGERED SPARK GAP DEVICE

David R. Matthews, Ann Arbor, Mich., assignor to Laser Systems Corporation, Ann Arbor, Mich.

Filed Oct. 10, 1969, Ser. No. 865,420
Int. Cl. H05b *37/00;* **H01j** *17/00*
U.S. Cl. 315—241 **18 Claims**

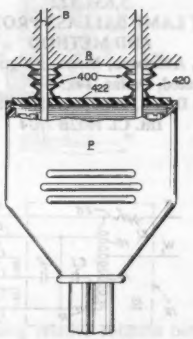


A triggered spark gap device as disclosed which is adapted to switch exceedingly high values of voltage and current over a large dynamic operating range. The device comprises first and second main electrodes defining a main gap and an auxiliary electrode defining a trigger gap with one of the main electrodes. The auxiliary electrode is electrically isolated from the main electrode as a separate discharge path and means are provided to limit the discharge current therethrough thereby minimizing deterioration of the auxiliary electrode under the influence of high-discharge current. Additionally, the auxiliary electrode is provided with means for preventing induced circulating currents to avoid excessive heating and deterioration thereof. In a preferred embodiment the dynamic range is extended by biasing the auxiliary electrode with reference to one of the main electrodes so that it may be positioned closer to the other main electrode to obtain reliable firing at low-main gap voltage. Additionally, the other main electrode may be provided with an auxiliary electrode for electric field forming to increase the upper limit of the dynamic range.

3,631,320
SAFETY DEVICE FOR CONVENIENCE-OUTLET CONNECTIONS

William F. Eckert, 3521 Belfont Drive, Ellicott City, Md.

Filed June 30, 1970, Ser. No. 51,035
Int. Cl. H01r *13/44*
U.S. Cl. 317—9 R **6 Claims**



A collapsing flexible sleeve for insulating the blades of plugs connected with electrical convenience outlets is disclosed. In one embodiment the sleeve is a tapered rubber bellows which nests to minimum thickness on collapsing; in another embodiment the sleeve is an elastic spiral of insulative material.

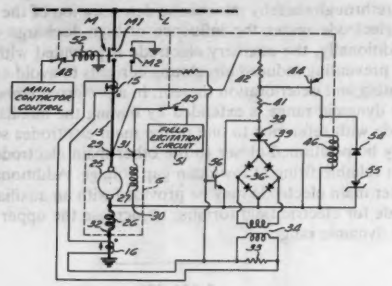
3,631,321
STATIC GROUND FAULT CIRCUIT

David L. Eisenstadt, Warrensville Heights, Ohio, assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Mar. 30, 1970, Ser. No. 23,632
Int. Cl. H02h *7/06*
U.S. Cl. 317—13 R **7 Claims**

A circuit for protecting a DC power source such as a DC generator or a battery from a ground fault condition between two points in a current path connected to the source. One point may be a terminal of the source and the other a load bus to which the source is connected by a feeder conductor. Sensing means such as a current transformer at each of the points senses changes in current flowing and provides a signal proportional thereto. The two sensing means are connected with their outputs in series opposition and produce a signal indicative of an unbalanced current change. This signal is employed to cause the source to be disconnected from the load bus and/or from the feeder conductor. When the DC source is a generator, the unbalance signal is used to inter-

rupt the generator field excitation. During generator buildup, a ground fault is detected by an increased voltage drop across the interpole winding. This voltage drop is utilized to cause the generator to be disconnected from the load bus



and its field deenergized. When the power source is a battery, a capacitor charged thereby energizes the actuating circuit temporarily when the battery voltage is lowered excessively by a ground fault.

3,631,322

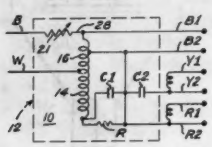
FLUORESCENT LAMP BALLAST PROTECTOR MEANS AND METHOD

Curtis F. Kruger, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 4, 1969, Ser. No. 882,237

Int. Cl. H02h *7/04*

U.S. Cl. 317—15 **7 Claims**



A fluorescent lamp ballast protector which senses and limits the amount of heat generated within a ballast, thereby keeping temperature in the ballast within a preselected temperature limit to avoid deleterious effects on insulation comprises a heat-responsive layer of material having negligible resistance at temperatures below a threshold and a resistance which increases by several orders of magnitude per degree at temperatures above the threshold. The layer is preferably placed in optimum heat-transfer relation with the windings and electrically connected in series relation between a power source and the ballast. The sensor/protector can be mounted on a separate heat-conductive member to enhance heat transfer.

3,631,323

SURGE-MODIFYING LIGHTNING ARRESTER CONSTRUCTION

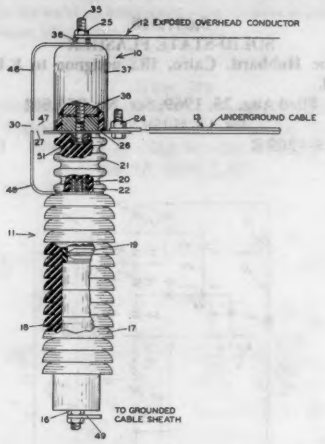
Ralph R. Pittman, 1015 Louisiana Street, Little Rock, Ark.

Filed June 9, 1970, Ser. No. 44,681

Int. Cl. H02h *1/04, 3/22*

U.S. Cl. 317—61.5 **14 Claims**

A valve-type lightning arrester construction includes a fast-responsive, magnetically saturable inductive member effective to facilitate uniform distribution of surge current discharging through the bound silicon-carbide blocks of the current-limiting valve material forming a part of the arrester, the improved current distribution throughout the blocks increasing the magnitude of the current which can be discharged through the blocks and concurrently decreasing block damage attending "fulgurite channeling." An additional desideratum is a greater degree of protection from



damage by superimposed surges, such as are initiated by lightning strokes to an exposed overhead electrical conductor, to connected cables or apparatus at points of electrical discontinuity, e.g., at the junction of an overhead line conductor with an underground cable.

3,631,324

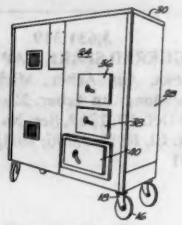
PORTABLE DISTRIBUTION PANEL

Richard D. Jones, 14851 Lewis Road, Miami Lakes, Fla.

Filed Apr. 24, 1967, Ser. No. 633,062The portion of the term of the patent subsequent to Dec. 28, 1987, has been disclaimed.

Int. Cl. H05k *7/14*

U.S. Cl. 317—99 **6 Claims**



A portable distribution panel having a main input side adapted to be connected to either of two different power sources, a regular line power source or a generator power source, and including a wheeled housing in which a circuit means are disposed for distribution of power to subfeed connectors, said circuit means including switching means for the subfeed lines and main input switching means.

3,631,325

CARD MODULE AND END WALL TREATMENT FACILITATING HEAT TRANSFER AND SLIDING

Charles F. Wenz, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

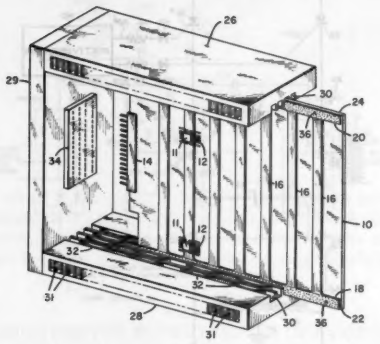
Filed June 15, 1970, Ser. No. 46,297

Int. Cl. H05k *7/20, 1/02*

U.S. Cl. 317—100 **2 Claims**

An electrical packaging arrangement is described wherein individual electrical components are mounted on printed wir-

ing boards with the body of the components in physical contact with heat sink strip members also located on the printed wiring boards. These heat sink strip members terminate at the edge of the board and the board is adapted to be inserted into slots provided in a frame member such that the frame member acts as a heat sink. The invention resides in providing a coating of a material having properties of high thermal conductivity and a low coefficient of friction between the heat sink strips on the edge of the board and the frame member. In practice, it is found that a coating of Teflon between the edge of the boards and the frame member provides excellent results.



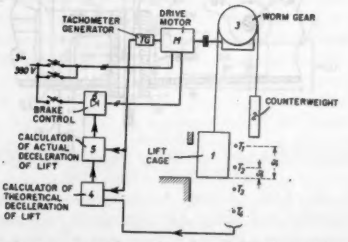
ERRATUM

For Class 318—138 see:
Patent No. 3,631,529

3,631,326
LIFT ARREST CONTROL

Vilkko Virkkala, Purjetuulenkuja 11,, Helsinki 85, and Matti Kahkipuro, Espoo, both of Finland

Filed Mar. 4, 1969, Ser. No. 804,070
Claims priority, application Finland, Mar. 8, 1968, 630/68
Int. Cl. H02p *5/22*
U.S. Cl. 318—140 11 Claims

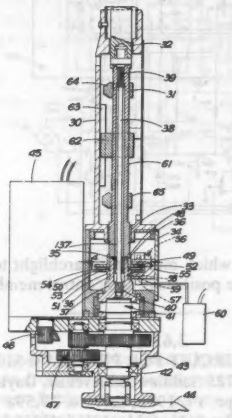


A method and device for controlling the speed of a lift when the lift is braked is characterized in that a reference or set-point value for controlling the device is dependent upon constant retardation used to stop the lift at a desired level, and that this set-point value is determined at checkpoints to be directly proportional to the square of the lift velocity and inversely proportional to the distance of the checkpoint from the desired stopping level.

3,631,327
DEVICES FOR SENSING RELATIVE ROTATIONAL DISPLACEMENT

Ivan Salisbury Payne, Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, England

Filed May 5, 1970, Ser. No. 34,701
Claims priority, application Great Britain, May 5, 1969, 22,880/69
Int. Cl. G05b *11/01*
U.S. Cl. 318—628 10 Claims



A device for sensing relative rotation between two members comprises two discs mounted on the members respectively, one disc having two areas of light-polarizing material each disposed opposite a corresponding area of light-polarizing material on the other disc. A light source transmits light through each pair of opposing discs, and two light-sensitive devices are disposed to receive the light transmitted through the pairs of opposing discs respectively. The discs of light-polarizing material are orientated to polarize the light in such planes that when there is rotational displacement from a datum position there is a decrease in the amount of light falling on one device and an increase in the light falling on the other device, the variation depending on the angle of displacement.

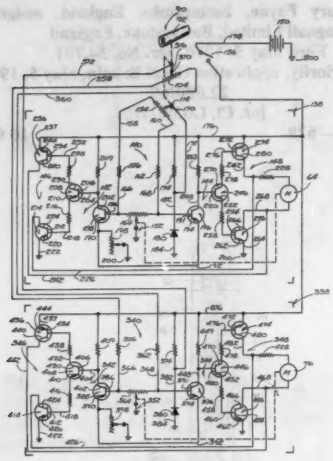
3,631,328
ELECTRONIC CONTROL MARINE SEARCHLIGHT

Gaylord M. Borst, and Robert A. Booty, both of Galesburg, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 7, 1970, Ser. No. 1,082
Int. Cl. G05b *1/06*
U.S. Cl. 318—663 8 Claims

Disclosed herein in a searchlight which is supported for movement about horizontal and vertical axes and a control member for remote operation of the searchlight. The control member is supported for movement about first and second or horizontal and vertical axes corresponding to the axes of the searchlight and is connected to vertical and horizontal position sensing potentiometers which form part of an electrical circuit. The electrical circuit includes transistor preamplifiers

and transistor switches which control operation of horizontal and vertical position electric motors which are connected to



the searchlight and which move the searchlight to a position corresponding to the position of the control member.

3,631,329

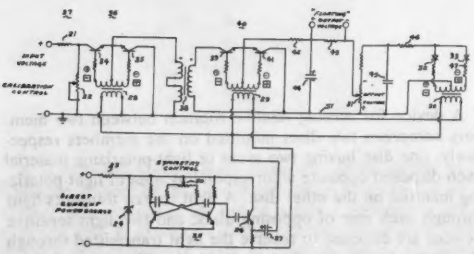
ISOLATION CIRCUIT FOR PROGRAM SIGNALS

Robert L. Kimball, 725 Saddlewood Avenue, Dayton, Ohio

Filed Apr. 17, 1970, Ser. No. 29,598

Int. Cl. H02m *3/32*; **G01r** *19/18*; **H03f** *3/38*

U.S. Cl. 321—2 **5 Claims**



Through a modulation-demodulation system having an offset control to reestablish a zero reference, relatively slowly changing single-ended (grounded) electrical direct current input signals are converted to a "floating" potential that may readily be applied to bridge and other electrical devices that require a fully floating input signal. The direct current input potential is modulated (chopped) at a frequency many times removed (higher) than the effective frequency of the input signal. The modulation is then removed by a balanced demodulator using the same chopping frequency providing a floating output signal.

3,631,330

PARALLEL INVERTER WITH DUAL CAPACITOR COMMUTATION AND INDUCTIVE OUTPUT MEANS

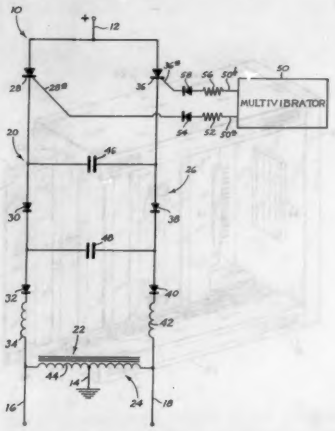
William L. King, Springfield, Oreg., assignor to Nathan E. Knecht, Springfield, Oreg.

Filed Aug. 10, 1970, Ser. No. 62,421

Int. Cl. H02m *7/48*

U.S. Cl. 321—45 C **2 Claims**

An inverter for converting DC to AC employing, in two parallel-disposed branches, silicon-controlled rectifiers each connected in series with a pair of diodes and an air-core coil. Interconnecting such branches are two commutating capacitors each having its opposite sides connected to the corresponding sides of corresponding diodes in the branches. The two branches mentioned are connected across an iron-core output inductor.



3,631,331

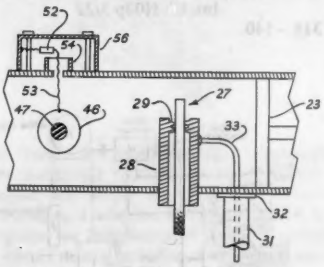
WAVEGUIDE FREQUENCY MULTIPLIER WHEREIN WAVEGUIDE CUTOFF FREQUENCY IS GREATER THAN INPUT FREQUENCY

David O. Fairley, San Jose, and Stephen C. McIntyre, Redwood City, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 10, 1970, Ser. No. 62,305

Int. Cl. H03b *19/00*; **H02m** *5/16*

U.S. Cl. 321—69 W **11 Claims**

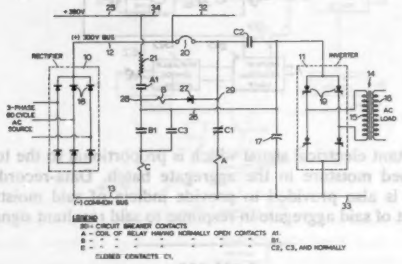


A frequency multiplier for the microwave region utilizing electromagnetic waveguide characteristics for frequency isolation. An input cavity is provided within an output waveguide with a natural cutoff frequency of the waveguide providing high pass isolation of output from input and a varactor diode as a coupling probe to the input cavity and as a mode launcher to the output to thus eliminate the requirement for a transition between varactor circuit and waveguide output. High efficiency and broad bandwidth operation is obtained.

3,631,332
INVERTER STARTING CIRCUIT

Dennis F. Williamson, Media, Pa., assignor to Canadian General Electric Limited, Toronto, Canada

Filed Sept. 11, 1970, Ser. No. 71,579
Claims priority, application Canada, Apr. 14, 1970, 080,030
Int. Cl. H02m 5/40
U.S. Cl. 321—45 S 5 Claims

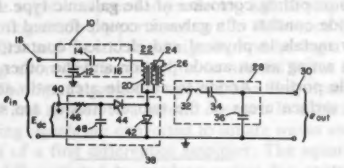


A frequency changer has a semiconductor rectifier for converting commercial frequency AC to DC, a thyristor inverter for converting the DC to adjustable frequency AC, and a capacitor bank connected across the input to the inverter for reactive inverter load control. According to the invention, the inverter is started by charging the capacitor through a resistor from an auxiliary DC source at a voltage significantly higher than the rectifier DC voltage. A relay responsive to a capacitor voltage slightly above the rectifier voltage connects the rectifier to the capacitor-inverter combination and disconnects the capacitor charging circuit. The switchover takes place at a capacitor voltage equal to or slightly in excess of the rectifier voltage.

3,631,333
ELECTRICALLY CONTROLLED ATTENUATOR

Henri T. Pichal, St. Petersburg, Fla., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed May 6, 1970, Ser. No. 34,939
Int. Cl. H01p 1/22; G05f 3/00
U.S. Cl. 323—66 23 Claims

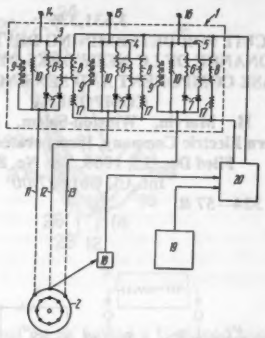


In an electrically controlled attenuator input signals pass through two transformer windings of opposing phase the signals then pass to output terminals. A DC control voltage varies the current through a variable impedance diode in series with one of the windings. The currents through the windings ordinarily cancel because of their phase opposition. The variable impedance diode regulates the currents through one of the windings and therefore the degree of cancellation. This varies the attenuation.

3,631,334
DEVICE FOR VOLTAGE STABILIZATION AT THE INPUT OF A POWER CONSUMER REMOTE FROM POWER SUPPLY SOURCE

Izrail Mordukhovich Pesis, and David Leonidovich Shvarts, both of Kharkov, U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro Po Electroburenilju (SKBE), Moscow, U.S.S.R.

Filed July 22, 1969, Ser. No. 843,568
Claims priority, application U.S.S.R., July 19, 1968, 1254002
Int. Cl. H02p 13/12; H03f 9/00
U.S. Cl. 323—85 3 Claims

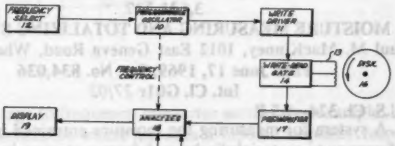


A voltage stabilization device at the input of a power consumer remote from a power supply source comprises a plurality of controllable magnetic power amplifiers including respective working power windings phase connected to respective current supply leads between the supply source and consumer; a plurality of shunting circuits with respective ones of the plurality of shunting circuits being parallel connected to a respective power winding of each magnetic amplifier, the impedance of each shunting circuit being a minimum at no-load consumer operation with maximum internal impedance working winding compensating for the voltage drop across the respective current supply lead and a maximum when the consumer operates under load with a minimum resistance of the respective working winding of the amplifier.

3,631,335
METHOD AND APPARATUS FOR MEASURING MAGNETIC GAP LENGTH

Allan E. Carr, Thousand Oaks, and Michael I. Behr, South Pasadena, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 25, 1970, Ser. No. 14,071
Int. Cl. G01r 35/00
U.S. Cl. 324—34 R 10 Claims



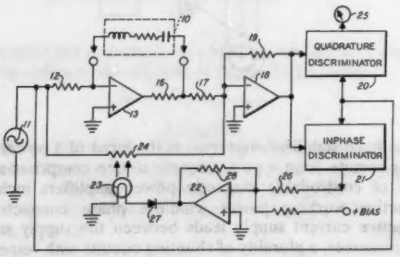
A technique is provided for measuring the magnetic gap length of a magnetic transducer, particularly useful when the gap length is only a few microns as is the case in modern transducers for high-density recording. According to this technique, a magnetic signal of known frequency is written

on a magnetic recording medium with a recorded wavelength being in the same order of magnitude as the magnetic gap length of the recording transducer. The same transducer is then employed for reading the recorded magnetic signals and the signal amplitude is measured over a very short frequency band so that the effect of most noise accompanying the signal is eliminated. These operations are repeated over a series of recorded wavelengths spanning the wavelength where the ratio of magnetic gap length to wavelength is about 0.88 at which point a signal minimum or null is observed. Knowing the frequency of the signal minimum permits a determination of the gap length.

3,631,336
CIRCUIT FOR DETERMINING DEVIATION FROM RESONANCE OF LC NETWORKS BY CANCELLING INPHASE COMPONENT AND SENSING QUADRATURE COMPONENT

William H. Marvin, Winston-Salem, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,146
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 R 6 Claims



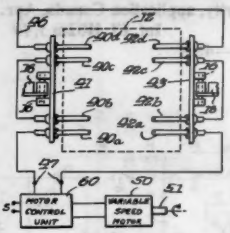
A circuit for measuring the deviation of resonance of a series LC circuit includes an operational amplifier with the series LC circuit connected in a feedback path. The amplifier output is connected to both an inphase discriminator and a quadrature discriminator. The output of the inphase discriminator controls an inverted inphase circuit to cancel out a substantial portion of the inphase component of the amplifier output which is applied to the quadrature discriminator. A circuit for measuring the deviation from resonance of a parallel resonance LC circuit includes a transformer with one side of the secondary connected in series with the operational amplifier and the LC circuit and with the opposite side of the transformer connected by a radiant energy controlled resistor to the input of the amplifier. The radiant energy controlled resistor is controlled by a lamp operated by an inphase discriminator to cancel a substantial portion of the inphase component of the signal through the parallel resonant circuit.

3,631,337
MOISTURE MEASURING AND TOTALIZING SYSTEM

Paul M. MacKinney, 1012 East Geneva Road, Wheaton, Ill.

Filed June 17, 1969, Ser. No. 834,036
Int. Cl. G01r *27/02*
U.S. Cl. 324—65 R 7 Claims

A system for measuring the moisture entrained in a batch of aggregate material discharged from a storage hopper and for compensating for said moisture in a batch-mixing apparatus. The system includes a plurality of electrical probes arranged to project into a free-falling stream of aggregate material in a plurality of vertical portions of said stream, as said stream is discharged from the storage hopper. Electrical circuit means connected to said probes create an electrical signal proportional to the conductivity and hence the moisture content of each vertical portion of the aggregate stream. Signal accumulating means is also provided to accumulate and integrate said electrical signals during the time interval of aggregate material flow past said probes to provide

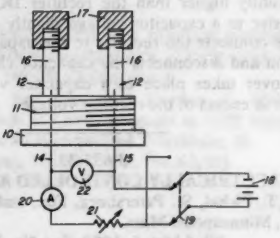


a resultant electrical signal which is proportional to the total entrained moisture in the aggregate batch. Data-recording means is also provided to provide indicia of said moisture content of said aggregate in response to said resultant signal.

3,631,338
METHOD AND APPARATUS FOR DETERMINING GALVANIC CORROSION BY POLARIZATION TECHNIQUES

Vincent F. Fitzpatrick, and Russell B. Richman, both of Richland, Wash., assignors to The United States of America as represented by the Secretary of the Interior

Filed June 30, 1969, Ser. No. 837,799
Int. Cl. G01n *27/00*
U.S. Cl. 324—71 R 8 Claims



A specially modified, two-electrode polarization probe is used to detect the onset of and qualitatively measure nonuniform or pitting corrosion of the galvanic type. Each probe electrode consists of a galvanic couple formed from two dissimilar metals in physical and electrical contact; one of the metals acting as an anode portion and the other acting as a cathode portion. Anode to cathode area ratio and total exposed surface areas of the two electrodes are substantially equal.

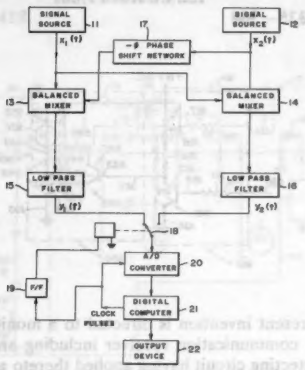
3,631,339
METHOD AND APPARATUS FOR HIGH-RESOLUTION SPECTRAL ANALYSIS

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Willard F. Gillmore, Altadena, Calif.

Filed Aug. 13, 1970, Ser. No. 63,383
Int. Cl. G01n *23/16*
U.S. Cl. 324—77 G 10 Claims

A method and apparatus for high-resolution power spectral analysis employing a digital computer is provided without stringent stability requirements on the sampling rate by using a pair of balanced mixers to combine one signal directly and in quadrature with a second signal, and alternately sampling the outputs of the mixers through an analog-to-digital con-

verter. The computer then carries out computations of a convolution spectrum from two autocorrelation and two cross-correlation functions which can be computed from the two sequences of samples with compensation for variations in



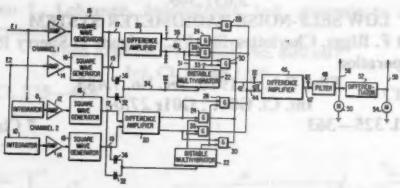
gain of the signal channels by normalizing correlation functions, and known deviation from $-90°$ in the quadrature mixing of signals by using ϕ in place of $-90°$ in the analysis and dividing the sum of the cross-correlation functions by $-\sin\phi$.

3,631,340

PHASE ANGLE ANALYZER

Joseph G. Miller, 22121 River Oaks Drive, Cleveland, Ohio

Filed Apr. 21, 1970, Ser. No. 30,392
Int. Cl. G01r *25/00*; H03d *13/00*
U.S. Cl. 324—83 A **10 Claims**



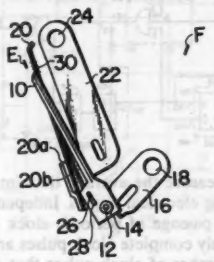
A phase angle analyzer for producing a first output signal having a magnitude proportional to the difference in phase between first and second input signals, and having a polarity depending upon whether the first or second input signal is leading. The input signals are applied to a first channel, and integrated and applied to a second channel. In each channel, the resulting signals are converted to square waves and fed to the inputs of a first differential amplifier. The square waves are also differentiated to produce pulses for controlling a bistable multivibrator. The multivibrator and differential amplifier control a plurality of gates acting as a double-pole, double-throw switch. The gated outputs from the two channels are logically combined and applied to a further differential amplifier. This amplifier produces at its output a series of pulses, each pulse being proportional in duration to the magnitude of the phase difference between the two input signals. The pulses are positive if the first signal leads the second signal, and are negative if the first signal lags the second signal. The pulses from the further differential amplifier are passed through a filter and applied to a meter to provide a direct reading of the phase relationship between the input signals. The output of the filter is differentiated and applied to a second meter to provide an indication of the rate at which the phase difference between the input signals is changing.

3,631,341

BIMETAL THERMAL GAUGE HAVING ZERO AND FULL SCALE CALIBRATION MEANS

Keiichi Kazuno, Ohmiya, Japan, assignor to Nissan Motor Company, Limited, Yokohama and Kanto Seiki Company, Limited, Ohmiya, Japan

Filed Sept. 21, 1970, Ser. No. 73,997
Claims priority, application Japan, June 19, 1970, 45/53291
Int. Cl. G01r *5/26, 1/38*
U.S. Cl. 324—106 **6 Claims**



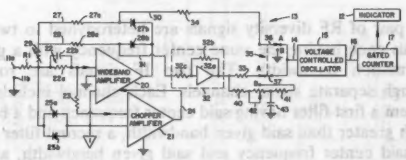
A bimetal thermal gauge having a U-shaped bimetal strip which is deformed when heated and a pointer which is rotatable about a stationary shaft and which is positioned relative to a graduated scale, the pointer being calibrated for alignment with respect to upper and lower limit lines of the scale by moving the bimetal strip in two directions. The alignments with respect to the lower and upper limits can be achieved independently from each other.

3,631,342

DIGITAL VOLTMETER APPARATUS EMPLOYING A BIPOLAR AMPLIFIER HAVING A UNIDIRECTIONAL OUTPUT AND A VOLTAGE CONTROLLED OSCILLATOR

John C. McDonald, Los Altos, Calif., assignor to Vidar Corporation, Mountain View, Calif.

Continuation of application Ser. No. 529,460, Feb. 23, 1966, now abandoned. This application Jan. 26, 1970, Ser. No. 6,043
Int. Cl. G01r *19/26*; H03k *5/00*
U.S. Cl. 324—120 **4 Claims**

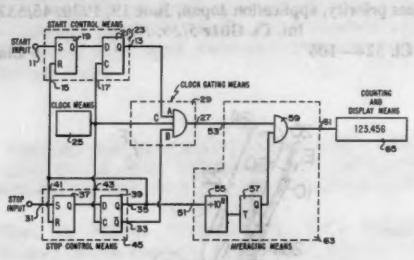


A voltage to frequency converter serving, for example, as a digital voltmeter which includes a bipolar amplifier responsive to both positive and negative DC inputs and also AC inputs. Coupled to the amplifier is a voltage-controlled oscillator which in combination with a counter provides an indication of the input voltage magnitude. The oscillator is responsive to a single polarity input voltage produced by the bipolar amplifier. To promote the DC stability of the amplifier a chopper amplifier converts all DC to AC which after reconversion to higher level DC is then coupled into the wide-band bipolar amplifier.

3,631,343
TIME INTERVAL AVERAGING CIRCUIT

Rolf Schmidhauser, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 27, 1970, Ser. No. 67,417
Int. Cl. G04f 9/00, 11/06
U.S. Cl. 324—186 3 Claims

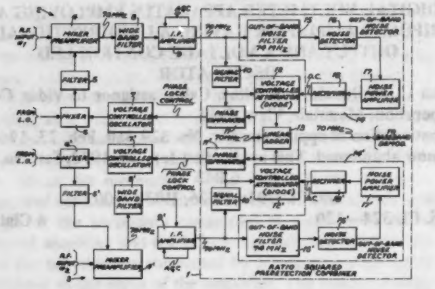


A circuit to measure the average time interval that occurs between recurring electrical signals. Independent input channels control the passage of periodic clock pulses through a gate such that only complete clock pulses are passed through the gate. The number of clock pulses that occur during 10^N time intervals (where N is an integer) is totalized and displayed.

3,631,344
RATIO SQUARED PREDETECTION COMBINING DIVERSITY RECEIVING SYSTEM

Charles Greenwald, Livingston, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 12, 1969, Ser. No. 884,528
Int. Cl. H04b 7/08
U.S. Cl. 325—305 10 Claims

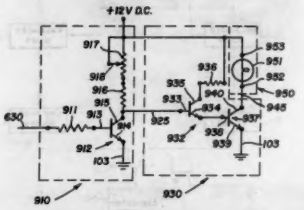


A pair of RF diversity signals are heterodyned to two IF signals each having the same center frequency with a given information bandwidth. The two IF signals are routed through separate signal channels. Each channel includes in tandem a first filter having said center frequency and a bandwidth greater than said given bandwidth, a second filter having said center frequency and said given bandwidth, and a continuously variable, voltage controlled attenuator. After said attenuator the IF signals are linearly added to provide a common IF signal for demodulation. The common IF signal is used as a reference signal for a phase comparator in each channel. Each phase comparator compares the phase of its associated IF signal at the output of said second filter to the reference signal and adjusts its associated IF signal for inphase combining thereof. Each channel further includes an out-of-band noise detector coupled to said first filter to produce a control voltage for coupling to the associated one of said attenuators to continuously control the amplitude of the associated one of the IF signals prior to the linear addition thereby achieving the desired ratio squared combining of the IF signals.

3,631,345
MONITOR CIRCUIT

Keith H. Wycoff, P.O. Box 308, Lexington, Nebr.

Original application Mar. 9, 1964, Ser. No. 350,163. Divided and this application Oct. 7, 1969, Ser. No. 871,101
Int. Cl. H04b 1/00
U.S. Cl. 325—364 4 Claims

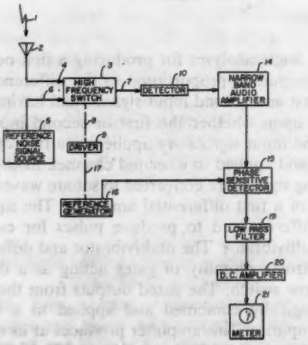


The present invention is directed to a monitor circuit for use in a communication receiver including an input circuit and a detecting circuit having applied thereto a carrier signal carrying intelligence from a transmitter, the monitor circuit comprising a monitor input circuit having the input thereof coupled to the detecting circuit and an output, the monitor input circuit being responsive to the application of the carrier signal to the receiver for providing a control signal on the output thereof, a monitor switch connected to the output of the monitor input circuit and having a first inoperative condition and a second operative condition, and a monitor indicator coupled to the monitor switch, the monitor switch being responsive to the application thereto of the control signal for actuating the monitor switch from the first inoperative position thereof to the second operative position thereof to operate the monitor indicator.

3,631,346
LOW SELF-NOISE RADIOMETER SYSTEM

Robert F. Riggs, Charlottesville, Va., assignor to Sperry Rand Corporation

Filed Feb. 2, 1970, Ser. No. 7,483
Int. Cl. G01t ; G01r 27/04
U.S. Cl. 325—363 7 Claims



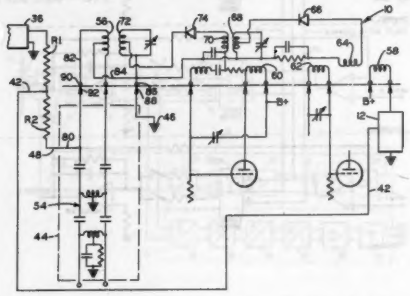
An improved microwave radiometer of the comparison type features elimination of broadband amplification through the employment of a modified high-frequency switch operating on the signal to be investigated in cooperation with a broadband low self-noise detector. The switch cyclically exposes the signal to be investigated and a reference signal to the detector at a rate of switching such that a strong component of the detected signal falls within the passband of a narrow band comparison and indicator system.

3,631,347

METHOD AND APPARATUS FOR FINE TUNING FOR A TELEVISION SET HAVING BOTH VHF AND UHF RANGES

Jack R. Chipman, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Dec. 4, 1968, Ser. No. 780,992
Int. Cl. H04b *1/16*
U.S. Cl. 325—418 5 Claims



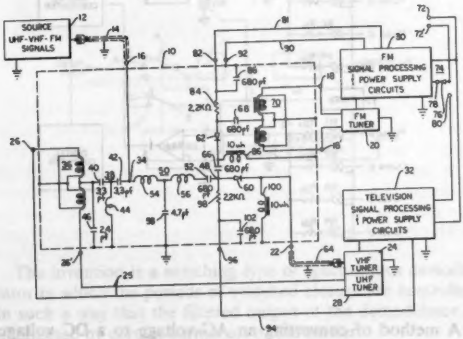
The invention relates to an automatic fine tuning system, especially for televisions, having both VHF and UHF ranges in which a frequency discriminator has its input connected to an intermediate frequency stage of the television and supplies a voltage signal to adjust the frequency of the local oscillator in the set in a direction to maintain the intermediate frequency substantially constant, and wherein the full voltage of the discriminator output is employed during VHF operation and a predetermined fractional part of the said voltage is employed during UHF operation.

3,631,348

SIGNAL DISTRIBUTION SYSTEM

William L. Lehmann, Indianapolis, Ind., assignor to RCA Corporation

Filed Feb. 19, 1969, Ser. No. 800,607
Int. Cl. H04b *1/06*
U.S. Cl. 325—458 4 Claims



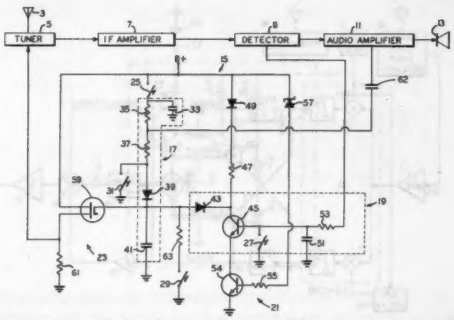
A signal distribution system includes a filter which separates UHF television signals from VHF television and FM radio signals. a tv receiver (VHF tuner) and an FM receiver are each coupled to the filter by a diode. Energization of a desired receiver causes an appropriate diode to be forward biased and electrically connect the filter to the desired receiver.

3,631,349

AUTOMATIC SIGNAL-SEEKING CIRCUITRY

Dong Woo Rhee, Williamsville, N.Y., assignor to Sylvania Electric Products Inc.

Filed Mar. 9, 1970, Ser. No. 17,442
Int. Cl. H04b *1/32*
U.S. Cl. 325—470 16 Claims



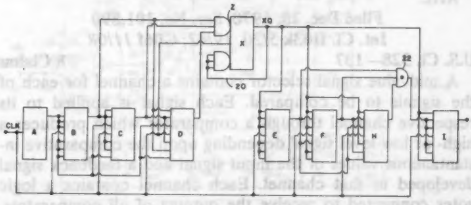
An FM receiver having a source of detected signals and a voltage-responsive tuner includes signal-seeking apparatus having a charging circuit coupled to the source of detected signals, connectable to a potential source by a switching device, and coupled to the voltage-responsive tuner by a potential follower means whereby a varying potential accumulated in the charging circuit is applied to the voltage-responsive tuner until a received signal is detected whereupon the application of the varying potential to the voltage-responsive tuner is automatically discontinued.

3,631,350

SYNCHRONOUS COUNTING APPARATUS

John Vernon Drake, Plano, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed Sept. 15, 1970, Ser. No. 72,468
Int. Cl. H03k *21/30*
U.S. Cl. 328—42 1 Claim

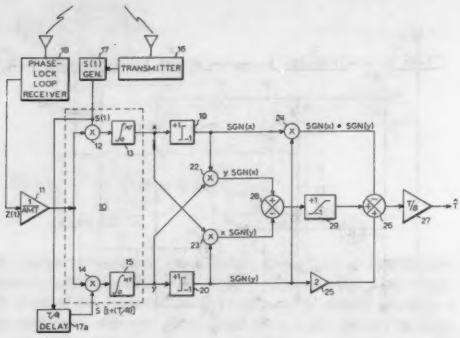


Apparatus for and the method of obtaining high-speed synchronous counting at speeds and an accuracy which would normally encounter problems due to delays in steering circuits used with the counting flip-flops. This is accomplished by the use of a synchronous AND gate operating in conjunction with a first section of flip-flops for controlling the remaining section of flip-flops.

3,631,351
SIGNAL PHASE ESTIMATOR

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Stanley Butman, Pasadena, Calif.

Filed Jan. 19, 1970, Ser. No. 3,696
Int. Cl. H03d *13/00*
U.S. Cl. 328—133 **7 Claims**



Apparatus is disclosed for estimating the amplitude and sign of the phase difference or time delay between a first signal $z(t)$ and a second signal. One replica $s(t)$ of the second signal and another $s[t+(T/4)]$ delayed a quarter period T are correlated with the first according to the equations:

$$x=\frac{1}{AMT}\int_0^{MT} z(t)s(t)dt$$

$$y=\frac{1}{AMT}\int_0^{MT} z(t)s[t+(T/4)]dt$$

where M is a multiple. The term $1/A$ is a term employed to make the signal $z(t)$ equal to the signal $s(t)$ in amplitude. A signal representing the value and sign of the time delay being estimated is then given by

$$\gamma=T/8\{2SGN(y)-SGN(x)SGN(y) -SAT[xSGN(y)-ySGN(x)]\}$$

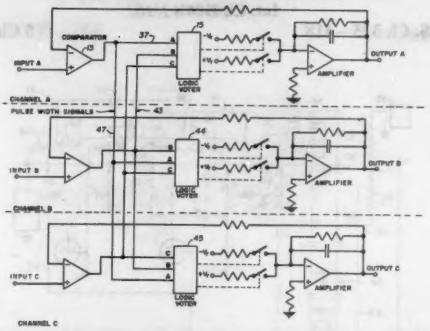
where $SGN(...)$ indicates the sign of the signal indicated in the parenthesis expressed as plus or minus a unit amplitude, and $SAT[...]$ indicates a value of the expression in the brackets limited to a unit amplitude.

3,631,352
MIDVALUE SIGNAL SELECTOR

Michael R. Kelley, and David A. Le Febre, both of Phoenix, Ariz.

Filed Dec. 28, 1970, Ser. No. 101,890
Int. Cl. H03k *5/20, 19/42*; **G06f** *11/08*
U.S. Cl. 328—137 **8 Claims**

A midvalue signal selector contains a channel for each of the signals to be compared. Each signal is applied to its respective channel through a comparator which produces a high- or low-level signal depending upon the comparative instantaneous values of the input signal and a feedback signal developed in that channel. Each channel contains a logic voter connected to receive the outputs of all comparators. The logic voter actuates a bipolar weighting switch in accordance with the high or low value of the majority of the signals applied to that logic voter. The output of the weighting switch in each channel is applied to a combination filter and operational amplifier which produces the output and feedback signals for that channel. The hysteresis inherent in a comparator, together with the filter circuit associated with the corresponding operational amplifier, produces an oscillatory signal at the output of the operational amplifier. The comparator receiving the midvalue signal produces a rectangular wave having a duty cycle dependent upon the magnitude of the midvalue signal. The output signal from the corresponding operational amplifier includes a DC component dependent upon the amount that this duty cycle

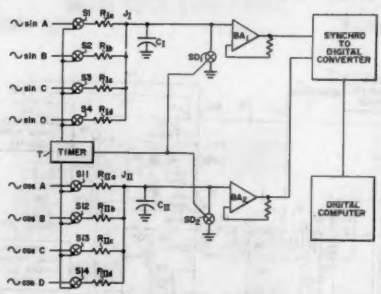


deviates from 50 percent. The comparators of the remaining channels produce steady output signals so that the corresponding logic voters respond only to the midvalue signal.

3,631,353
MULTIPLEXING ARRANGEMENT USED IN CONVERTING AN AC SIGNAL TO A DC SIGNAL

Herbert S. Jarecki, E. Rutherford, and Bob N. Naydan, Wyckoff, both of N.J., assignors to The Singer Company, New York, N.Y.

Continuation-in-part of application Ser. No. 641,347, May 25, 1967, now abandoned. This application Oct. 24, 1969, Ser. No. 871,430
Int. Cl. H03b *1/04*
U.S. Cl. 328—139 **3 Claims**

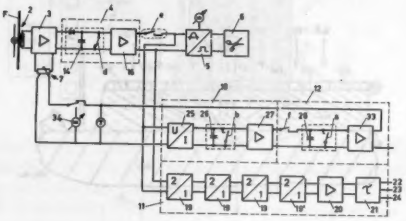


A method of converting an AC voltage to a DC voltage corresponding substantially to the fundamental sinusoidal AC components by dropping said AC voltage through an input line across a series resistor and parallel capacitor, to an output line, comprising the step of opening up the input line at a predetermined time of the changing input sinusoidal voltage depending on its frequency and the values of the capacitor and resistor so as to obtain a DC voltage having a large percentage of the AC sinusoidal fundamental component while minimizing the effects of the harmonic and quadrature content.

3,631,354
APPARATUS FOR THE AUTOMATIC ADJUSTMENT OF A YARN CLEANER

Hermann Werffeli, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Feb. 16, 1970, Ser. No. 11,461
Claims priority, application Switzerland, Mar. 5, 1969, 3354/69
Int. Cl. H01j 19/82
U.S. Cl. 328—271 13 Claims

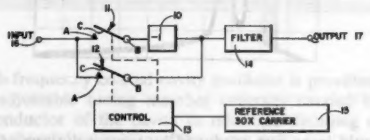


An apparatus for the automatic adjustment of a yarn cleaner at a winding machine, such yarn cleaner embodying at least one measuring cell, an amplifier and a pulse shaper. A signal feedback circuit electrically couples the output of the pulse shaper with the input of a control device which by means of its output signal brings about the adjustment of the amplification gain at the aforementioned amplifier. The signal feedback circuit embodies a pulse evaluation circuit which serves to generate an average value signal from a predetermined number of signals appearing at the output side of the pulse shaper.

3,631,355
SYNCHRONOUS DEMODULATOR

Robert W. Vail, Newport Beach, Calif., assignor to North American Rockwell Corporation

Filed Oct. 16, 1970, Ser. No. 81,231
Int. Cl. H03d 3/18
U.S. Cl. 329—50 4 Claims



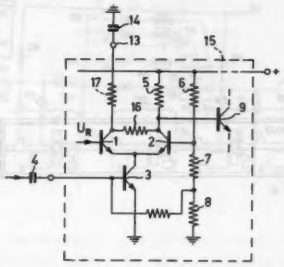
The invention is a switching type of synchronous demodulator in which the periods of switched closure are controlled in such a way that the filtered output of the demodulator is unaffected by certain harmonics of the carrier.

The demodulator is comprised of an input terminal for receiving an amplitude modulated carrier signal and a pair of switching means. Each of the switch means is connected to the input terminal in the closed position. A filter means is connected to the output of each of the switching means and an inverter is connected to one of the switching means to invert the signal passing through that switching means. A control means is provided for alternately holding said switches closed for two periods of 120° each during two complete 360° cycles of the carrier signal and for holding both switches open for the remainder of each cycle.

3,631,356
CONTROLLABLE AMPLIFIER STAGE

Wilfried Aschermann, Volkswohlweg 1, 21 Hamburg 90, Germany

Filed Dec. 16, 1969, Ser. No. 885,543
Claims priority, application Germany, Dec. 20, 1968, P 18 16 034.4
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 6 Claims

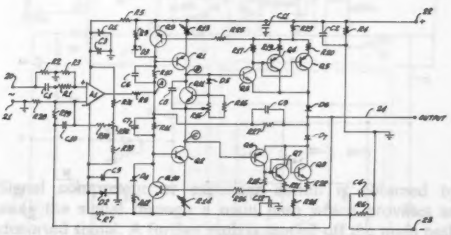


An integrated signal-controlled amplifier stage uses a differential amplifier emitter coupled to a signal input amplifying transistor connected in the grounded emitter configuration. In order to provide DC stabilization of the output transistor in the differential amplifier a first resistor is connected between a source of constant potential and the output collector of the differential amplifier to provide direct current to the output transistor and, through a second resistor connecting the collectors of the differential amplifier, to the control voltage transistor of the differential amplifier. In addition, a capacitor is connected between the collector of the control voltage transistor and ground.

3,631,357
AMPLIFIER

Dawson N. Hadley, Claremont, Calif., assignor to Marantz Co., Inc., Sun Valley, Calif.

Filed Mar. 10, 1969, Ser. No. 805,484
Int. Cl. H03f 3/18
U.S. Cl. 330—17 11 Claims

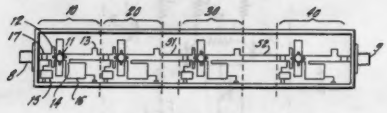


A solid-state audiopower amplifier using a single operational amplifier feeding a dual channel, substantially class A drive circuit for a pair of substantially class AB, complementary symmetry power amplification stages, distortion being controlled by the degree of conductive cycle overlap between the channels of the drive circuit, and power output being held to safe levels by a current limiting loop in each channel between each power amplification stage and its corresponding drive circuit. Temperature compensation is also provided.

3,631,358
MULTISTAGE-TYPE MICROWAVE AMPLIFIER

Kazuo Ayaki, Tokyo-to, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed Jan. 14, 1969, Ser. No. 790,989
Claims priority, application Japan, Jan. 17, 1968, 43/2513
43/21415; May 7, 1968, 43/31415, 43/31416, 43/31417
Int. Cl. H03f 3/60
U.S. Cl. 330—53 5 Claims

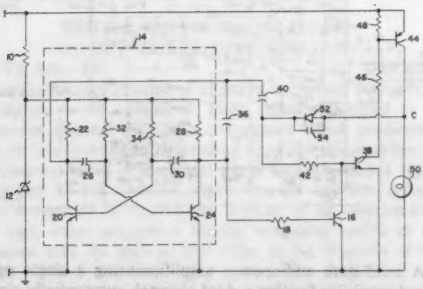


A microwave amplifier comprising a plurality of amplifier units connected in cascade fashion. Each of the amplifier units have substantially similar gain-versus-freuqency characteristics, which characteristics are substantially flat over the entire operating frequency range. The units are connected by lines which in the microwave amplifier embodiment may be strip lines having electrical lengths which are selected in accordance with any one of a group of predetermined equations so as to provide a multistage microwave amplifier whose resultant gain-versus-frequency characteristic is likewise substantially flat over the entire operating frequency range.

3,631,359
MULTIVIBRATOR DRIVEN REGENERATIVE TRANSISTOR DRIVE CIRCUIT FOR LAMP FLASHER

Raymond A. Jones, Swampscott, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed May 6, 1970, Ser. No. 34,935
Int. Cl. H03b 3/282; H05b 39/09
U.S. Cl. 331—75 3 Claims

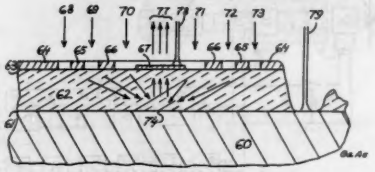


This is a solid-state lamp flasher operated from an oscillator using the combination of NPN-transistor and a PNP-transistor to drive the load and create regenerative action and another NPN-transistor to stop the regenerative action when it receives a signal from the oscillator.

3,631,360
ELECTRO-OPTICAL STRUCTURES UTILIZING FRESNEL OPTICAL SYSTEMS

Kurt Lehovec, 11 Woodlawn Drive, Williamstown, Mass.

Continuation-in-part of application Ser. No. 653,245, July 13, 1967, now Patent No. 3,569,997. This application July 10, 1970, Ser. No. 53,811
Int. Cl. G02f 1/28; H01j 1/62; H01s 3/00
U.S. Cl. 331—94.5 6 Claims

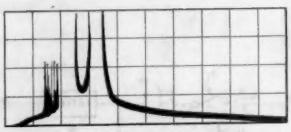


This invention concerns improved structures for the transformation of radiant energy into electric energy or vice versa. The improvement consists in coupling a solid having excited electron states with a Fresnel optical system into a compact integrated structure. The solid having excited electron states can be a semiconducting microcircuit element, or a laser material.

3,631,361
ROOM TEMPERATURE LIQUID LASER

Norman C. Blumenthal, Brooklyn, N.Y., assignor to The Singer Company, New York, N.Y.

Filed July 22, 1968, Ser. No. 746,442
Int. Cl. H01s
U.S. Cl. 331—94.5 5 Claims



A liquid laser was produced by using solutions of a non-hydrogen containing neodymium compound, e.g., neodymium oxide in a 5:1 by volume solution of phosphorous oxychloride and strong nonhydrogen containing (aprotic) acid, e.g., tin tetrachloride contained in a tubular transparent cell using optical flats bonded to the ends of the cell, external dielectric mirrors aligned parallel to the ends of the cell and exciting the substance in the cell with a flash lamp.

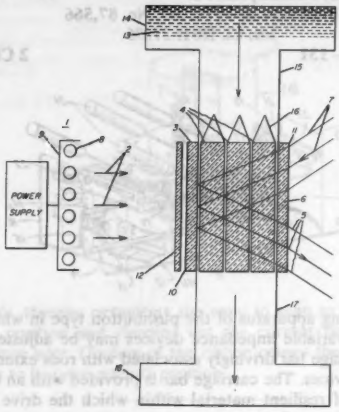
3,631,362
FACE-PUMPED, FACE-COOLED LASER DEVICE

Joseph C. Almasi, and William S. Martin, both of Schenectady, N.Y., assignors to General Electric Company

Filed Aug. 27, 1968, Ser. No. 755,652
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 8 Claims

A face-pumped laser device utilizes one or more thin planar laser elements which have major surfaces thereof in physical contact with a flowing coolant having an index of

refraction near that of the laser elements. The arrangement allows increased pulse repetition rates while also maintaining



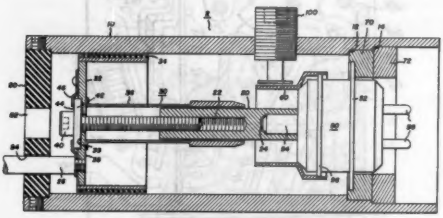
uniform optical properties and relaxing wavelength tolerance requirements of the laser elements.

3,631,363

HIGH-FREQUENCY CAVITY OSCILLATOR HAVING IMPROVED TUNING MEANS

Harold D. Miller, Owensboro, Ky., assignor to General Electric Company

Filed Nov. 14, 1969, Ser. No. 876,657
Int. Cl. H03b *5/18*
U.S. Cl. 331—97 **4 Claims**



A high-frequency coaxial cavity oscillator is provided having an adjustable tuning member centrally carried by the inner conductor of the cavity to minimize detuning of the cavity by thermal expansion of the outer wall.

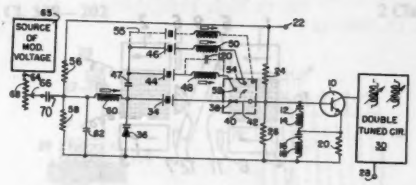
3,631,364

COMPACT, DIRECT FM MODULATOR PROVIDING CONSTANT DEVIATION ON EACH OF A PLURALITY OF ADJUSTABLE CENTER FREQUENCIES

William Alan Schilb, Lombard, and Donald Lindsey Booth, Chicago, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 12, 1970, Ser. No. 2,302
Int. Cl. H03c *3/22, 3/28*
U.S. Cl. 332—26 **11 Claims**

A multiple center frequency, direct FM modulator includes an oscillator having a plurality of center frequency determining circuits each of which is comprised of a piezoelectric crystal and a warping coil. A switch connects a selected center frequency determining circuit between a varactor and the active element of the oscillator. The capacitance of the varactor is changed by a modulating voltage to provide frequency deviation about the center frequency of oscillation. The crystal has an undesirable tendency to change the deviation corresponding to a given change in varactor capacitance, as the inductance of the warping coil associated therewith is changed. To compensate for this undesirable change in deviation, the values of the components



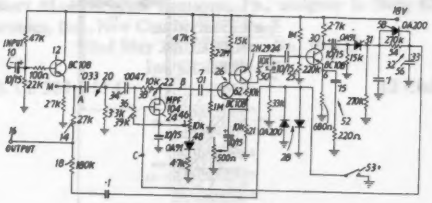
in the frequency controlling circuit of the oscillator are selected such that adjustment of the warping coil causes a change in the variation of equivalent capacitance connected with the crystal so that the frequency deviation corresponding to a modulating voltage of a given amplitude remains constant.

3,631,365

SIGNAL COMPRESSORS AND EXPANDERS

Ray M. Dolby, London, England, assignor to Dolby Laboratories Inc., New York, N.Y.

Filed Oct. 20, 1969, Ser. No. 867,454
Claims priority, application Great Britain, July 21, 1967, 36,466/69 Nov. 1, 1968, 51,985/68
Int. Cl. H04b *3/04;* **H03q** *7/06*
U.S. Cl. 333—14 **27 Claims**



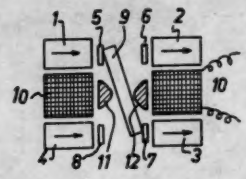
Signal compressor or expander action is obtained by passing the signal through a main path which provides an undistorted signal. A further path is tapped off the main path and amplifies and limits the signal. The output of the further path is used to boost or buck the signal in the main path to obtain compressor or expander action. This action takes place in a restricted frequency band defined by a variable filter in the further path, this filter being responsive to the output of the further path to narrow the pass band when this output increases. The filter comprises two filters in cascade, a fixed value filter and a variable filter which includes a voltage-controlled variable resistance. The two filters can be simple RC filters but in combination they give a 12dB/octave cutoff which is important in avoiding noise modulation effects. Various advantageous filter configurations are disclosed.

3,631,366

POLARIZED ELECTROMAGNETIC RELAYS HAVING A FLOATING ARMATURE

Pierre E. Ugon, 21 rue Claude Debussy, Saint-Germain-en-Laye, (Les Yvelines), France

Filed July 22, 1969, Ser. No. 843,640
Claims priority, application France, July 23, 1968, 160183
Int. Cl. H01h 51/22
U.S. Cl. 335—82 4 Claims



A polarized electromagnetic relay wherein an armature is freely movable about its center of gravity between two pairs of contact members.

ERRATA

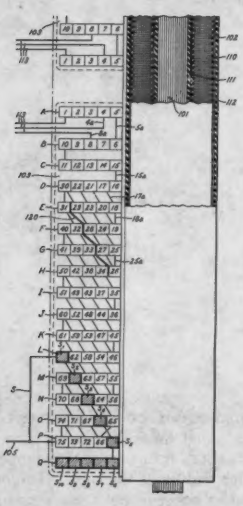
For Classes 335—213 and 336,155 see:
Patent Nos. 3,631,533 and 3,631,534

3,631,367

CONICAL LAYER TYPE RADIAL DISK WINDING WITH INTERWOUND ELECTROSTATIC SHIELD

John C. Dutton, and Daniel B. Scott, both of Rome, Ga., assignors to General Electric Company

Filed Oct. 29, 1970, Ser. No. 85,137
Int. Cl. H01f 15/04
U.S. Cl. 336—70 8 Claims



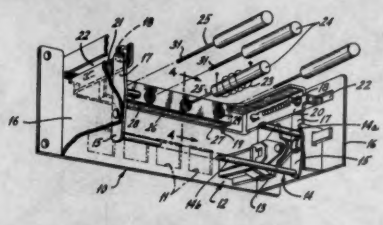
A radial disk-type inductive winding for high-voltage electric apparatus wherein coil turns are interlaced in such turn-to-turn sequence that directly serially connected turns form conical layers of turns in coaxial nested relation, and wherein an insulated shielding conductor is interwound to occupy the last full length conical layer of turn positions at one end of the winding and is electrically connected at one point to the winding terminal at that end.

3,631,368

RADIO TUNING APPARATUS

Alvin E. Thompson, North Wales, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Nov. 6, 1970, Ser. No. 87,566
Int. Cl. H01f 21/06
U.S. Cl. 336—131 2 Claims



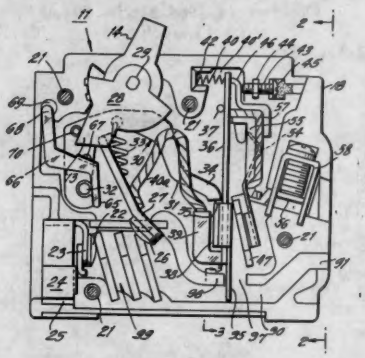
Radio tuning apparatus of the pushbutton type in which a plurality of variable impedance devices may be adjusted by use of a carriage bar drivingly associated with rods extending from said devices. The carriage bar is provided with an elongated strip of resilient material within which the drive rods are frictionally received.

3,631,369

BLOWOFF MEANS FOR CIRCUIT BREAKER LATCH

Gustavo A. Menocal, Philadelphia, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Apr. 27, 1970, Ser. No. 32,101
Int. Cl. H01h 9/30, 33/02, 71/00
U.S. Cl. 337—110 5 Claims



A circuit breaker having automatic fault responsive trip means for releasing a latch to permit the operating mechanism to open the contacts is provided with a baffle which extends into the arcing gas venting passage. The baffle is connected to the latch and is positioned transverse to the flow of arcing gases through the venting passage, so that upon the occurrence of severe overload conditions, rapid gas pressure buildup in the passage will act to move the baffle and thereby physically moving the latch toward tripping position prior to movement of the latch by the fault current responsive means.

3,631,370

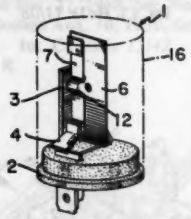
HIGH-CURRENT, HOT WIRE RELAY AND FLASHER

Arthur J. Hollis, Danvers, Mass., assignor to Sylvania Electric Products Inc.

Filed Oct. 1, 1969, Ser. No. 862,812
Int. Cl. H01h 61/06
U.S. Cl. 337—125 6 Claims

A monostable snap vane of a high-current flasher is held just beyond its snap point in an open contact position by an

expansion ribbon fastened to opposite corners of the vane. Upon the passage of electric current through a resistance wire wrapped around the ribbon, the ribbon thermally ex-



pands, thereby permitting the vane to snap to a closed contact position and shorting out the current flow to the resistance wire. Cooling of the ribbon causes the vane to snap back to its open contact position.

ERRATUM

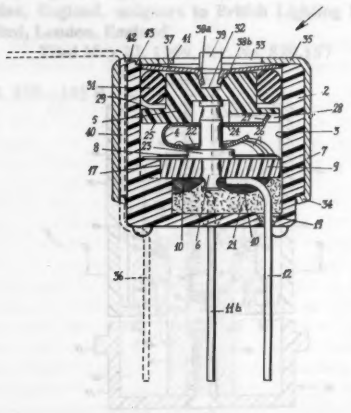
For Class 337—161 see:
Patent No. 3,630,219

3,631,371

ROTARY-CONTACT POTENTIOMETER

Jean Maurice, Nice, France, assignor to Societe Francaise de l'Electro Resistance

Filed June 30, 1970, Ser. No. 51,292
Claims priority, application France, July 29, 1969, 6925938
Int. Cl. H01c 9/02
U.S. Cl. 338—164 **9 Claims**



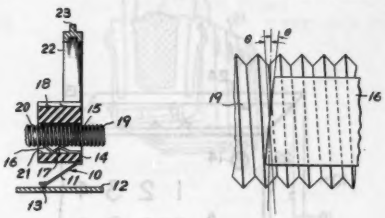
A rotary-contact potentiometer especially of the miniature type and primarily intended for use in electronic circuitry comprising an insulating casing having an axial cavity and containing in addition to other components a slider and slider-actuating member which are both rotatably mounted on a shaft attached to the casing, means for driving said actuating member, a resistance track, an external metal jacket which surrounds the casing and serves to maintain all the components in position. The potentiometer comprises at least one stop which is associated with the control means aforesaid and serves to limit the angular displacement, said stop being constituted by a boss formed on the jacket. At the end of travel, the effort is therefore exerted on a metallic stop which is endowed with sufficient mechanical strength.

3,631,372

VARIABLE RESISTOR OF LEAD SCREW ACTUATED TYPE WITH CONTACT ENGAGING SCREW THREADS

Takashi Yamamura, Iwai-Machi, Sashima-gun, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Kanagawa-ken, Japan

Filed June 12, 1970, Ser. No. 45,777
Claims priority, application Japan, June 12, 1969, 44/54564
Int. Cl. H01c 9/02
U.S. Cl. 338—202 **2 Claims**



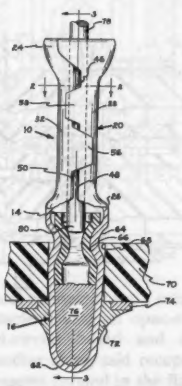
A variable resistor comprises a rotatable screw shaft having a screw on the outer periphery thereof, a resistor disposed in parallel with the screw shaft, a movable member formed of a bent leaf spring of electroconductive metal, and a movable member holder through which the screw shaft passes. The movable member holder holds the movable member. The movable member has at one end thereof a slidable contact portion contacting with the resistor. The other end of the movable member contacts with the portions of the grooves of the screw having the effective screw diameter. The movable member also has a protuberant middle portion contacting with adjacent crests of the screw. The edge line of the other end of the movable member has an inclination angle with respect to a vertical plane to the axis of the screw shaft, which angle is reverse in direction to the lead angle of the screw and substantially equal to the lead angle in absolute value.

3,631,373

PLUGGABLE SOCKET CONNECTOR

Robert M. Matrisian, Lemoyne, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.

Filed May 20, 1970, Ser. No. 39,042
Int. Cl. H05k 1/02
U.S. Cl. 339—17 C **12 Claims**



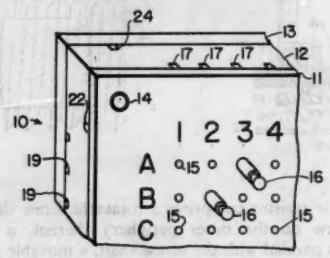
A circuit board socket connector having a longitudinal seam with antispreading fingers on both sides of the seam extending across the seam and into close proximity with the

outside part of the socket across the seam. The fingers limit spreading of the seam when a lead is inserted into the socket.

3,631,374
MATRIX SWITCH

Joseph M. Cartelli, c/o Infolite Corp., 2337 Lemoine Ave., Fort Lee, N.J.

Filed Aug. 24, 1970, Ser. No. 66,407
Int. Cl. H01r *25/00, 27/02*
U.S. Cl. 339—18 C 7 Claims

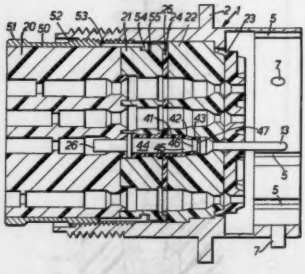


A matrix switch contains an array of apertures intersected on two or more levels by aligned channels containing thin conducting strips backed by elastic strips, the insertion of a pin in an aperture contacting and flexing conducting strips on different levels and compressing elastic backing strips to maintain good electrical contact.

3,631,375
ELECTRICAL CONNECTORS

Kenneth Frederick Bridle, London, England, assignor to A. B. Electronic Components Limited

Filed Apr. 1, 1970, Ser. No. 24,784
Int. Cl. H01r *13/40*
U.S. Cl. 339—59 M 4 Claims

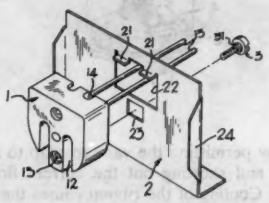


The specification describes a multiway electrical connector in which the individual contacts are retained in individual collet members which in turn are retained in a first retainer member and are compressed on to the contacts by a second retainer member.

3,631,376
FLUORESCENT LAMP HOLDER MOUNTING

Thomas C. Halfaker, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 12, 1970, Ser. No. 88,598
Int. Cl. H01r *33/08*
U.S. Cl. 339—53 5 Claims

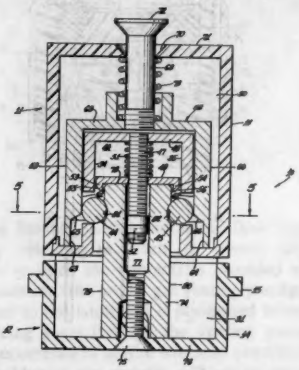


A mounting plate for providing limited play in any direction for a fluorescent lampholder for a U-shaped lamp.

3,631,377
COUPLING

David J. Ball, Banning, and Michael E. R. Soderlindh, La Jolla, both of Calif., assignors to The Deutsch Company Electronic Components Division, Banning, Calif.

Filed Apr. 1, 1970, Ser. No. 24,660
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 B 12 Claims



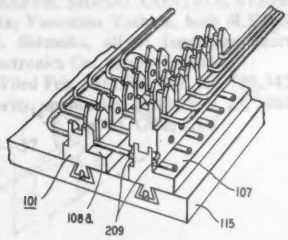
This invention provides an electrical connector and coupling arrangement including a plug and receptacle of rectangular cross section, with each having an integral shell and inner portion, the latter carrying contacts engaged when the connector is mated, with a centrally located coupling mechanism including a post on one member having shallow transverse recesses receiving rollers carried by the other member and held in engagement with the recesses by a retractable member which is moved by an exteriorly operable element to release the coupling mechanism.

3,631,378

WIRE-CONNECTING BLOCKS

Benjamin C. Ellis, Jr., Baltimore, Md., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Original application Dec. 27, 1968, Ser. No. 787,453. Divided and this application Aug. 10, 1970, Ser. No. 69,511
Int. Cl. H01r 13/42
U.S. Cl. 339—125 R 1 Claim



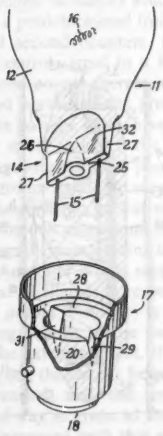
This disclosure describes an indexing strip and connecting block scheme for equipment and station interconnections for key telephone systems. The indexing strip is a plastic molding with two narrowly spaced rows of teeth. The insulated line wires are placed across the slots between the teeth. The connecting block straddles the teeth and its pin connectors are each guided into piercing contact with a respective wire. The blocks and strips lock, once engaged. Wall mountings for the strips include bases with V-shaped insertion tracks.

3,631,379

INCANDESCENT FILAMENT LAMPS

John Willoughby Thomas Wright, deceased, late of Leicester, England (by Audrey M. Wright and Denis W. Clarke, Leicester, England, legal executors), and Trevor Humphery, London, England, assignors to British Lighting Industries Limited, London, England

Filed May 23, 1969, Ser. No. 829,157
Int. Cl. H01r 13/32
U.S. Cl. 339—145 R 3 Claims



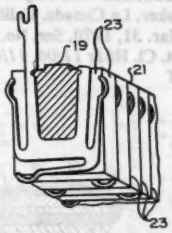
An incandescent filament lamp having an envelope closed with a wedge-shaped pinch seal and a cap disposed about the seal. The cap is closed by a plug of vitritelike material and an extension of said plug provides a seating structure for the seal.

3,631,380

UNIVERSAL CIRCUIT BOARD CONNECTOR

Patrick A. Bohn, 20115 Pacifica Drive, Cupertino, Calif.

Filed Mar. 19, 1970, Ser. No. 21,136
Int. Cl. H05k 1/04
U.S. Cl. 339—156 R 2 Claims



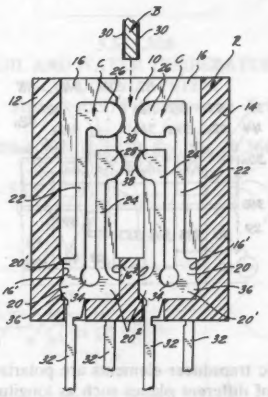
A multiplane connector includes spaced contact elements on each of three orthogonally oriented surfaces and connection means of selected configuration on the fourth orthogonally oriented surface. A selected number of contact elements may be supported by an insulating body in laterally spaced relationship to provide a connector of predetermined length having such selected number of independent contact means for each surface.

3,631,381

MULTIPLE ELECTRICAL CONNECTOR

Robert B. Pittman, River Edge, N.J., assignor to Industrial Electronic Hardware Corp., New York, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,134
Int. Cl. H05k 1/07
U.S. Cl. 339—176 MP 14 Claims



A multiple electrical connector for a printed-circuit board embodying a receptacle having an open-topped trough for receiving a printed-circuit board and contact elements spaced from one another along said receptacle trough, featured by contact elements formed in the flat as from a sheet of conductive material and each comprising a base and a pair of spring legs of different lengths extending up from the base, the contact element being positioned in the receptacle in a plane normal to the plane of the printed-circuit board. The spring legs provide a redundancy in that the legs function in-

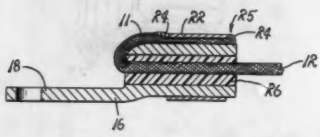
dependently to provide an electrical connection to the contact areas of the board and have independent deflection and resonant frequencies.

3,631,382

ELECTRICAL CONNECTOR

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Charles D. Baker, La Canada, Calif.

Filed Mar. 31, 1970, Ser. No. 24,224
Int. Cl. H01r 11/06, 11/08
U.S. Cl. 339—275 T 5 Claims



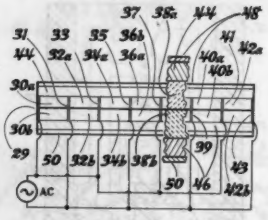
A sterilizable electrical connector which readily can be inspected after sterilization characterized by a flexible multistrand conductor coupled with a barrel-and-lug terminal element, a feature of the connector being an elastomer disposed within the barrel and securing an end of the conductor therewithin while the distal end of the conductor is secured to the exterior of the barrel through a circumscribing and deformed ferrule.

3,631,383

PIEZOELECTRIC TRANSDUCER CONFIGURATION

Gene Zilinskas, Van Nuys, Calif., assignor to The Bendix Corporation

Filed July 25, 1969, Ser. No. 844,861
Int. Cl. H04r 17/00
U.S. Cl. 340—10 10 Claims



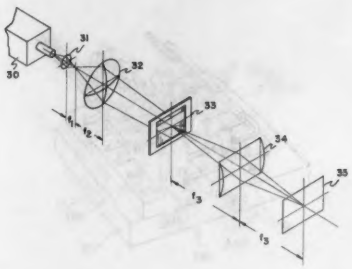
Piezoelectric transducer elements are polarized to vibrate in a number of different planes such as longitudinally, radially, or axially. Polarized flat disk or bar transducers have been severely limited in power-handling capacity because of the inherent weakness of the usual piezoelectric materials in tension. Applicant has found that flexural disk-type elements as well as "bender bar" types of transducers, all of which require that the piezoelectric elements be stressed in tension, gain very substantially in power-handling capacity when a thin layer of material, such as a metal plate, is bonded to the face exposed to tensile forces. Alternately, a laminate layer of glass epoxy was also found effective to improve the power handling capabilities of the transducers, and this has been found especially useful where an electrical insulating layer is required.

3,631,384

SEISMIC HOLOGRAPHY

Noyes D. Smith, Jr., Bellaire, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Apr. 4, 1969, Ser. No. 813,503
Int. Cl. G01v 1/34
U.S. Cl. 340—15.5 DS 9 Claims



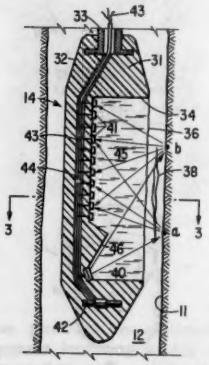
A method for processing seismic data wherein seismic arrival time-distance sections are produced from seismic data traces received at points located along lines through an areal array of receivers, at least one signal corresponding to a reference wave being combined with each section, visible strips of one-dimensional Fourier transforms relating to a selected frequency of each seismic section being optically produced from each section and the visible strips arranged as the sections were arranged in the original array with the so-arranged strips being illuminated with coherent light to produce a three-dimensional visible display of the acoustic images resulting from the reflection and diffraction of seismic energy from subterranean structures.

3,631,385

HOLOGRAPHIC WELL-LOGGING SYSTEM

Daniel Silverman, Tulsa, Okla., assignor to Amoco Production Company

Filed Nov. 24, 1969, Ser. No. 879,218
Int. Cl. G01v 1/28, 1/34
U.S. Cl. 340—18 2 Claims



By an adaptation of elastic-wave holography, data are recorded from which a hologram can be prepared for reconstructing an image of a well wall to show fractures, vugs, dips, stratification and like features. An expanse of well wall

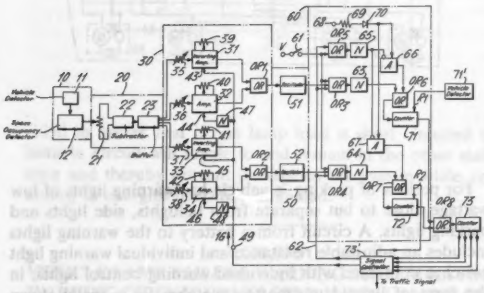
is irradiated with high-frequency, coherent sound waves, and the interference pattern of the irradiating sonic energy and that returned from the wall expanse to a detection area is recorded to form an acoustic holograms at the detection area. By a combination of axial and rotary-scanning motions of the logging apparatus, a continuous hologram is obtained suitable for reconstruction to view as much as desired of the entire well-wall area.

3,631,386

TRAFFIC SIGNAL CONTROL SYSTEM

Tutomu Saita; Yasumasa Yoshida, both of Kyoto, and Norio Yamazaki, Shizuoka, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 14, 1969, Ser. No. 799,343
Claims priority, application Japan, Feb. 19, 1968, 43/10451
Int. Cl. G08g 1/08
U.S. Cl. 340—37 **14 Claims**



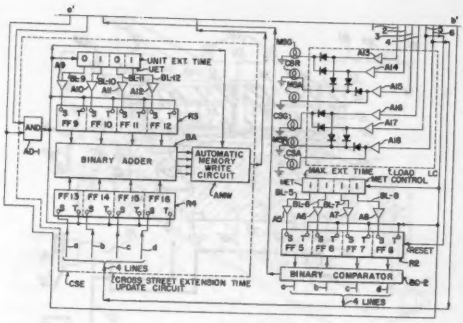
A system for controlling the duration of an extended portion of the green or proceed phase displayed to traffic at an intersection of a major street and at least one minor street comprises first and second oscillators which normally provide pulse outputs having a predetermined frequency f_o which are supplied to first and second counters, respectively. These counters provide a control signal to a third counter when separate, predetermined counts therein are reached for terminating the extended portion of the green phase. The first counter is reset by the passage of each vehicle by a detector on a major or minor street to which the green phase is displayed so that its output represents a plurality of unit extensions thereof. On the other hand, the second counter is reset at each change of phase and its output represents a limit to the total duration of the unit extensions. A congestion sensor furnishes an output signal corresponding to traffic occupancy on the major street. Amplifier means supply a control signal to the first and second oscillators in responses to this output signal such that their output frequency is changed from f_o to effect a corresponding change in the duration of both the unit extensions and the extension limit. If the right-of-way is given to the major street, the output frequency is lowered so that each unit extension and the extension limit are lengthened. If right-of-way is given to the minor street, the output frequency is increased such that each unit extension and the extension limit are shortened. An embodiment for immediately shifting right-of-way from the minor to the major street when congestion increases beyond a specified point is shown, as are embodiments permitting control of the green phase displayed to both streets in accordance with the individual traffic congestions thereof.

3,631,387

UNIT EXTENSION CIRCUIT MEANS FOR TRAFFIC CONTROL SYSTEM

Frank W. Hill, Moline; Joseph E. Meschi, Lyon, both of Ill., and Peter G. Bartlett, Davenport, Iowa, assignors to Gulf & Western Industries, New York, N.Y.

Filed Apr. 1, 1969, Ser. No. 827,083
Int. Cl. G08g 1/08
U.S. Cl. 340—37 **20 Claims**



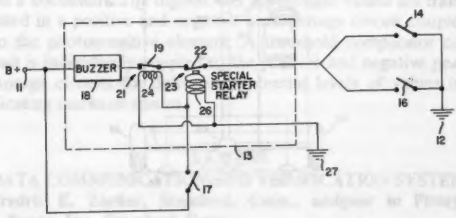
An activated traffic control system is disclosed herein for controlling the time duration that a traffic signal displays a go signal to at least one traffic lane in accordance with traffic demand. The system includes a go extension interval memory and an extension interval control circuit for acting upon the memory to change the time duration of the go extension interval. The system also includes a plurality of traffic interval time storage memories which are electrically alterable and electrically interrogatable for storing binary signals having corresponding values representative of the desired time durations of the associated traffic intervals.

3,631,388

ENGINE OIL AND WATER TEMPERATURE AUDIO WARNING SYSTEM

Raymond K. Strong, 41974 Chadbourne Drive, Fremont, Calif.

Filed Sept. 8, 1970, Ser. No. 70,366
Int. Cl. B60q 5/00
U.S. Cl. 340—52 F **2 Claims**



A system which audibly warns a driver of a motor vehicle when either the engine oil pressure is too low or the temperature is too high. The system is so arranged that the audible warning is not sounded during initial startup of the engine when the oil pressure is inherently low.

3,631,389

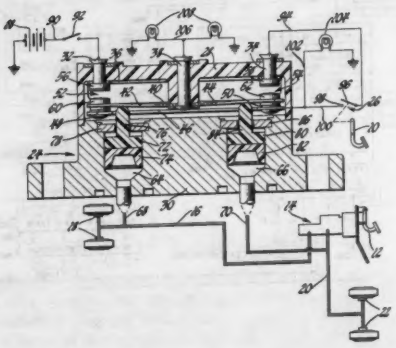
BRAKE SYSTEM CONDITION WARNING SYSTEM AND SWITCH ASSEMBLY THEREFOR

Harold V. Elliott, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of application Ser. No. 587,887, Oct. 19, 1966, now abandoned. This application Apr. 17, 1970, Ser. No. 28,239

Int. Cl. B60q 1/44; B60t 17/22

U.S. Cl. 340—60 5 Claims



A switch assembly having switch sections separately actuated by front and rear brake pressures, and connected in electric circuitry to warn when either system fails to pressurize. The circuitry includes the parking brake warning light and the vehicle stoplights.

3,631,390

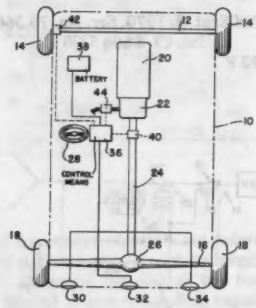
VEHICLE MOVEMENT CONDITION SAFETY LIGHT SYSTEM

Thomas S. B. Murphy, 991 Ridgefield Road, Wilton, Conn.

Filed Nov. 21, 1969, Ser. No. 878,608

Int. Cl. B60q 1/54

U.S. Cl. 340—62 2 Claims



A vehicle has a plurality of stroboscopic lights mounted thereon. An electrical circuit is provided for operating the stroboscopic lights and includes a source of electrical energy as well as speed-responsive switch means which is responsive to the speed of movement of the vehicle for causing the stroboscopic lights to be illuminated in accordance with the speed of the vehicle when the vehicle is traveling in a forward direction. Control switch means are provided for selectively operating the stroboscopic lights in different manners in accordance with whether the vehicle is at rest, is in reverse, is to make a left turn, is to make a right turn, or is traveling forward and making no turns.

3,631,391

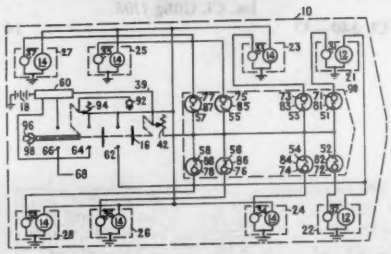
ELECTRIC SYSTEM FOR LIGHTING A PARKED VEHICLE

Hans A. Eckhardt, 55 Crescent Bend, Allendale, N.J.

Filed Mar. 3, 1969, Ser. No. 803,571

Int. Cl. B60q 1/26

U.S. Cl. 340—76 3 Claims



For periods of parking, a vehicle has warning lights of low wattage close to but separate from taillights, side lights and parking lights. A circuit from a battery to the warning lights includes an adjustable resistance and individual warning light switches combined with individual warning control lights, in the form of lighted pushbutton switches, in a scaled-down symbol of the vehicle at the dashboard. When parking, the driver lights selected warning lights on the outside of the vehicle by pushing the corresponding pushbutton switches in the symbol of the vehicle which then also light giving a clear picture as to which warning lights are turned on. In addition, the driver adjusts the resistance to render the turned-on warning lights brighter or dimmer, as reflected in the brightness of the corresponding lighted pushbutton switches, and depending on weather and other traffic conditions. In a modification the warning lights are controlled by a switch which is actuated by axially pulling or pushing the vehicle's light control to an extra position. In this position, by turning the vehicle's light control, the adjustable resistance may be adjusted and thus the brightness of the warning lights varied.

3,631,392

CONTROL SYSTEM FOR ALTERNATELY ENERGIZING TWO SIGNAL LAMPS AT A PREDETERMINED RATE AND IN A FAIL-SAFE MANNER

William B. Zelina, Erie, Pa., assignor to General Systems, Inc., Erie, Pa.

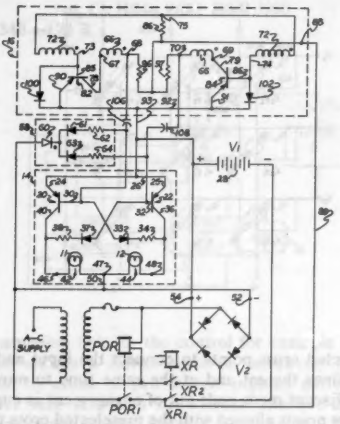
Filed May 9, 1968, Ser. No. 727,862

Int. Cl. G08b 5/36

U.S. Cl. 340—83 17 Claims

A control system for alternately energizing first and second lamp loads at a predetermined rate wherein a bistable circuit is connected with the lamp loads so that one lamp load is energized when the bistable circuit is in one stable operating state and the other lamp load is energized when the bistable circuit is in the other stable operating state. An oscillator system is coupled with the bistable circuit to effect triggering thereof between the two stable operating states. The oscillator system may be supplied from a first power source, such as a battery, and the switching system for a second power

source, such as a rectifier operating from commercial power, with means provided to detect failure of the second power source and change the connection of the bistable circuit from the second to the first power source. Means may also be provided to assure that if one lamp load is short circuited the bistable circuit will toggle to and remain in the other stable state and thereby prevent damage to the system while continuing to energize the other lamp load.

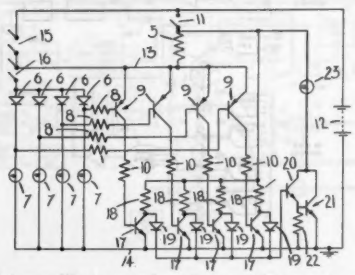


3,631,393

VEHICLE LAMP FAILURE WARNING SYSTEM HAVING WARNING CIRCUIT COMPLETED WHEN LAMP IS OFF

Allan Bennett, Solihull, England, assignor to Joseph Lucas Industries Limited, Birmingham, England

Filed June 16, 1969, Ser. No. 833,404
Claims priority, application Great Britain, July 1, 1968, 31,263/68
Int. Cl. G08b *21/00*; B60q *1/02*
U.S. Cl. 340—85 **2 Claims**



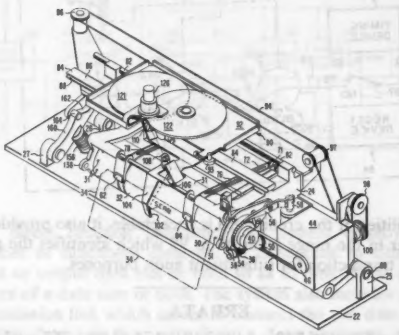
A lamp failure warning system for a road vehicle has a first lamp circuit which is completed when the lamp is to be illuminated and a second lamp circuit which is completed when the lamp is extinguished but has a resistance sufficiently high to ensure that the lamp is not illuminated. Means is provided sensitive to failure of the lamp when either circuit is completed for giving a warning when the lamp fails.

3,631,394

CHARACTER RECOGNITION SCANNING APPARATUS

Jerome Danforth Harr, San Jose; Reynold Benjamin Johnson, Palo Alto; Ralph Eugene Marrs, Campbell; Ernie George Nassimbene, and George Edmund Price, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,626
Int. Cl. G06k *7/14*
U.S. Cl. 340—146.3 F **6 Claims**



The recognition of human- and machine-readable characters of a family of type of which each character has no more than 12 segments is enhanced by a dual-disk segmented scanning arrangement. The generic-type family format is a medianly quartered parallelogram (MQP) embracing both slanted and upright printing, the latter being more specifically in the format of an orthogonally quartered rectangle (OQR). The scanning apparatus comprises an opto-mechanical subassembly for precisely scanning the short straight line segments in seriatim. A pair of rotating disks are arranged in overlapping relationship with apertures at the point of scan moving in directions substantially normal to each other, and both disks are moving past the scanning point in a direction opposite to the direction of one of the disks. The disks are usually rotating at the same speed and in opposite directions, and the apertures are arranged for scanning a multiplicity of characters for each full rotation of the disks. The apertures are divided into slits and slots with a slit in one disk cooperating with a slot in the other disk moving in the direction of an image line segment under consideration. An opto1-electronic arrangement produces an electric representation in response to the presence and absence of a character line segment in the image. The opto-electronic arrangement comprises a photosensitive diode arranged to receive light from an area on a document. The highest and lowest light values are translated in a positive and negative peak storage circuit coupled to the photosensitive element. A threshold comparator circuit is individually coupled to the positive and negative peak storage circuits for delivering potential levels of values indicating marks or spaces.

3,631,395

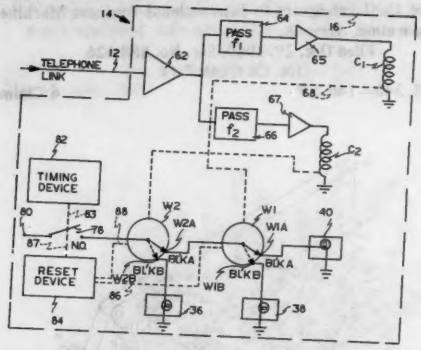
DATA COMMUNICATION AND VERIFICATION SYSTEM

Fredric E. Zucker, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed July 27, 1970, Ser. No. 58,242
Int. Cl. H04q *9/00*
U.S. Cl. 340—149 A **7 Claims**

A system for communicating more than 100 different digital message combinations over a single voice-grade telephone link, using different combinations of only two frequency tones. The invention is particularly useful in a credit card verification system comprising a satellite station where the card is identified, a communications link over

which card identification information is transmitted, and a computer station which sends back an answer in the form of frequency tones uniquely specifying one of four verification



possibilities. If the credit card is acceptable, it also provides a number in the range from 00 to 99 which identifies the particular transaction for subsequent audit purposes.

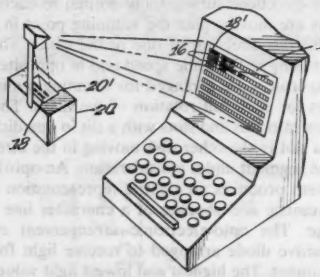
ERRATA

For Classes 340—149, 340—172, 340—267 and 340—283 see:
Patent Nos. 3,631,535 thru 3,631,538

3,631,396
DATA VERIFICATION METHOD AND SYSTEM

Eugene D. Spertus, Barrington; Harry A. Spertus, Barrington Hills, and Philip Spertus, Glencoe, all of Ill., assignors to Hypertech Corporation, Harwood Heights, Ill.

Filed June 4, 1969, Ser. No. 830,349
Int. Cl. G06f *11/00*; G08c *25/00*
U.S. Cl. 340—149 **13 Claims**



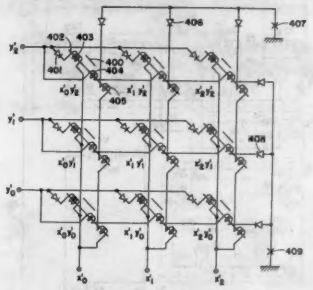
A method and system for entering data into a data-processing system and simultaneously verifying the data by displaying the original information or an image thereof, entering the original information into the system, and displaying the entered information in a format similar to the format of the original information and in juxtaposition therewith.

3,631,397
SIGNAL SWITCHING DEVICE

Sadayuki Mitsuhashi, and Takeo Shinohara, both of Tokyo-to, Japan, assignors to Nippon Electric Company, Limited, Tokyo-to, Japan

Filed July 3, 1969, Ser. No. 839,039
Claims priority, application Japan, July 10, 1968, 43/48690
Int. Cl. G11b *5/00*; H04g *9/00*
U.S. Cl. 340—166 S **12 Claims**

A cross point signaling switch including unidirectional conductive diodes, magnetic cores and groups of electric windings wound on the cores for interconnection with input and output control lines to cause current to flow in predetermined windings at predetermined cross points aligned with preselected input and output control lines to activate the cores associated therewith to produce magnetic fields to move the overlapping adjacent reeds ends into engagement

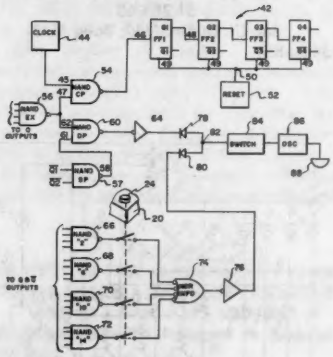


at preselected cross points to connect the input and output signaling lines thereat and at the same time to move overlapping adjacent reeds ends out of engagement as engaged at other cross points aligned with the preselected cross points to disconnect the input and output signaling lines thereat, without disturbing the signaling connection at the preselected cross points.

3,631,398
TV REMOTE CONTROL SYSTEM

Larry R. Houghton, St. Joseph, Mich., assignor to Whirlpool Corporation

Filed Oct. 12, 1970, Ser. No. 79,866
Int. Cl. H04g *9/00*
U.S. Cl. 340—167 R **24 Claims**

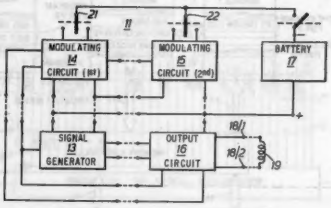


A remote control transmitter for controlling a television receiver generating a composite signal of single-frequency pulses including a selected binary code combination of information bits, a synchronization pulse prior to each information bit, and an elongated execute pulse at the end of the last information bit. A remote control receiver locally generates clock pulses corresponding to the received synchronization pulses to enable a storage device to serially store the received information bits. The stored information is decoded during storage and, upon reception of the execute pulse, a single output is provided corresponding to the selected function.

3,631,399
PULSE CODE MODULATED TRANSMITTER-RECEIVER TRANSMISSION LINK

George E. Minns, Hounslow, Middlesex, England, assignor to Dewhurst & Partner Limited

Filed July 14, 1969, Ser. No. 841,429
Claims priority, application Great Britain, July 12, 1968, 33,481/68
Int. Cl. H04q 9/00; H04l 3/00
U.S. Cl. 340—171 R 6 Claims

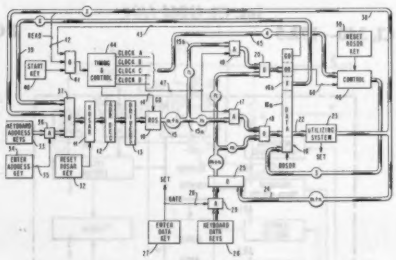


A transmission link for the control for example of a window hoist utilizes a carrier signal C selectively frequency modulated by either of two inverse primary periodic pulse signals A1 and A2, with or without selective frequency modulation of the selected primary signal A1 or A2 by either of two similar but lower frequency secondary signals B1 and B2. Each of the primary and secondary signals is detected by periodic charge and discharge of capacitance and periodic sampling of the capacitance charge level. The pulses are of nonunity mark/space ratio, being distinguished by a DC blocking capacitance producing pulses of opposite polarity and nonunity mark/space ratio and hence of unequal amplitudes, detected by a threshold level detecting device.

3,631,400
DATA-PROCESSING SYSTEM HAVING LOGICAL STORAGE DATA REGISTER

James T. Dervan, III, Salt Point, and James R. Moysey, La Grangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,570
Int. Cl. G06f 7/06
U.S. Cl. 340—172.5 5 Claims

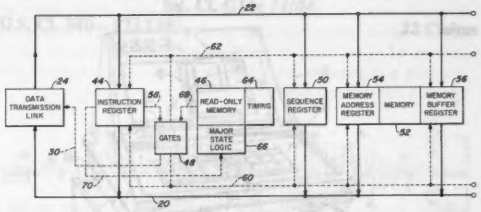


A data-processing system includes a read-only storage data register in which words can be selectively ORed. A read-only storage has its output connected to the register. When the store is cycled to read out a word, the register is either reset prior to being set in accordance with the word or, the reset is inhibited whereby the contents of the word is ORed with a word previously placed in the register. A word may also be placed in the register from an alternate source such as a keyboard or a utilizing system.

3,631,401
DIRECT FUNCTION DATA PROCESSOR

Saul B. Dinman, Wayland, Mass., assignor to GRI Computer Corporation, Newton, Mass.

Filed July 29, 1969, Ser. No. 845,760
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 10 Claims

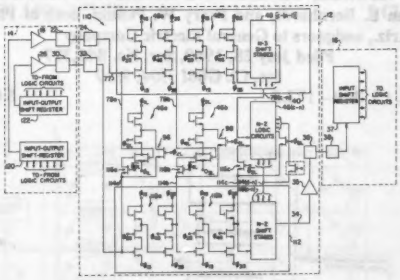


A direct function data-processing system employing a number of functional elements all connected to either an input or output data bus or both so as to function as a data source of a data user or both. The system also includes a data transmission link which serves to connect the two data buses so that data can flow only from a data source to a data processor either directly, or by being shifted left or right, or by having one bit added thereto, or by being complemented. A simple control circuit is used to control the operation of the transmission link.

3,631,402
INPUT AND OUTPUT CIRCUITRY

Jack O. Field, West Carrollton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Mar. 19, 1970, Ser. No. 21,150
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 29 Claims



Input and output circuitry is described which enables one to time share certain pads on an integrated circuit chip between several signals. This may be accomplished by providing shift registers for these pads and having each shift register receive, in parallel, the data bits provided by several of the logic circuits on the chip. Each shift register thereafter provides a signal which represents the data in serial order, and this signal is applied through the pad to a pad on a second chip. The signal is thereafter applied to a shift register on the second chip, and the data bits appear at its outputs in parallel. The data bits are thereafter applied to logic circuits on the second chip.

3,631,403
RETAIL SALES TRANSACTION TERMINAL

Einar Asbo, Castro Valley; Joseph R. Herr, Los Altos Hills, and Jerry W. Sublett, Newark, all of Calif., assignors to The Singer Company, New York, N.Y.

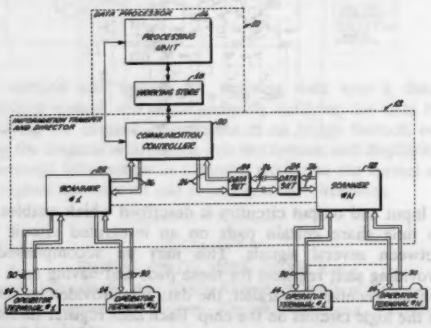
Filed Sept. 8, 1969, Ser. No. 855,904
Int. Cl. G06f 15/02, 15/20
U.S. Cl. 340—172.5 16 Claims

A data input and function-directing terminal in the form of a point of sale transaction device having manually operable numerical and function specifying keys, and a data processor comprised of a read-only-memory, a set of data-handling registers and a read/write memory for manipulation of data between the terminal and various ones of a plurality of input/output devices according to a sequence of operator actions that are supervised by a fixed program in the read-only-memory, and variable program that may be entered manually into the processor.

3,631,404
DATA COMMUNICATION SYSTEM INCLUDING ADDRESS-GENERATING MEANS AND METHOD

Donn E. Bernhardt, and Perry W. Penton, both of Phoenix, Ariz., assignors to General Electric Company

Filed July 28, 1969, Ser. No. 845,397
Int. Cl. G06f 3/04, 9/20
U.S. Cl. 340—172.5 5 Claims

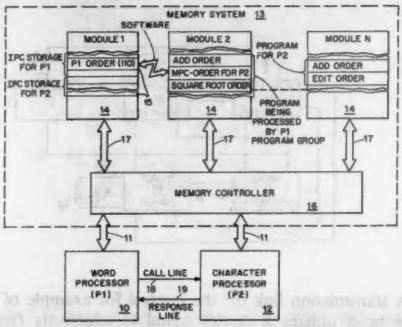


The controller provided services transmit and receive queues of data in a data processor memory, in a manner which is substantially independent of the data processor in respect to the transfer in and out of the queues of messages to and from data terminals.

3,631,405
SHARING OF MICROPROGRAMS BETWEEN PROCESSORS

George S. Hoff, Sudbury, Mass., and Richard P. Kelly, Nashua, N.H., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 12, 1969, Ser. No. 875,900
Int. Cl. G06f 9/12, 15/16
U.S. Cl. 340—172.5 21 Claims

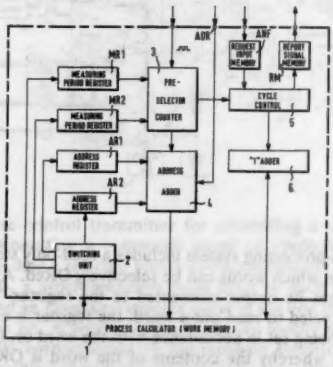


A multiprocessor system includes two microprogrammed processors, each having a different instruction repertoire and capable of executing separate programs or portions thereof independently. Both processors share a common memory unit and communicate through established groups of memory storage locations. One processor is word-oriented and processes data using a fixed word format while the other processor is character-oriented and processes data using a variable length format. The microprogrammable control elements of both processors are interconnected to permit the fixed word processor to share microprograms of the variable length processor for executing instructions not included in its repertoire.

3,631,406
METHOD OF CONTINUOUSLY EXCHANGING DATA BETWEEN A DATA PROCESSING APPARATUS AND EXTERNAL DEVICES

Hans Kurner, Karlsruhe, Germany, assignor to Siemens AG, Berlin and Munich, Germany

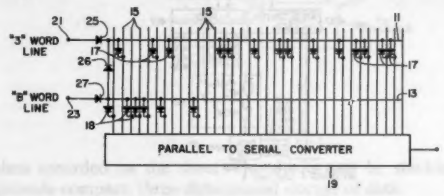
Filed Nov. 19, 1969, Ser. No. 878,053
Claims priority, application Germany, Nov. 22, 1968, P 18 10 413.7
Int. Cl. G06f 1/04
U.S. Cl. 340—172.5 2 Claims



For a continuous exchange of data between the memory of a data processing apparatus and external devices, the data

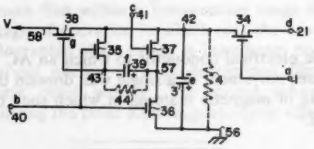
are alternately stored in one of two partial ranges of said memory. While storing is in progress in one partial range, the data of the other partial range may undergo processing.

3,631,407
CHARACTER MEMORY OF REDUCED SIZE
Douglas A. Cotter, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.
Filed June 25, 1969, Ser. No. 836,514
Int. Cl. G11c *17/00, 11/38*
U.S. Cl. 340—173 SP **9 Claims**



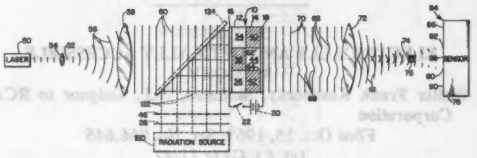
Read-only memory size reduction based on the implication theory of logical mathematics. A different designation number is generated by the memory in response to the application of an interrogation pulse to each of the word line input terminals. If one of the designation numbers implies another designation number, then the latter may be generated from the former with a cross-point impedance element saving which equals the number of logical bits that are common to both designation numbers.

3,631,408
CONDENSER MEMORY CIRCUIT WITH REGENERATION MEANS
Masaharu Kubo, Hachioji-shi, and Minoru Nagata, Kodaira-shi, both of Japan, assignors to Hitachi, Ltd., Chiyoda-ku, Tokyo, Japan
Filed Sept. 15, 1969, Ser. No. 857,824
Claims priority, application Japan, Sept. 13, 1968, 43/65583
Int. Cl. G11c *7/00, 11/24*
U.S. Cl. 340—173 CA **11 Claims**



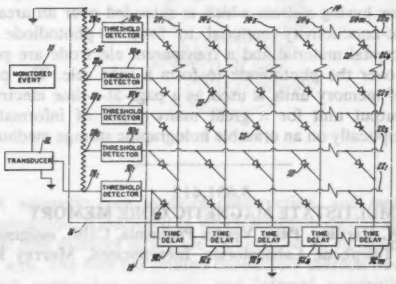
A condenser memory circuit comprising a condenser in which information is stored as an electric charge, and means closed by application of a regenerative instruction pulse of a certain specific period under the condition that the electric charge is stored in said condenser, said means connecting a regeneration power source to said condenser; said condenser memory circuit characterized in that when a stored charge is present in the condenser, the stored charge is regenerated at each regenerative instruction pulse by the regeneration voltage supplied from said regeneration power source.

3,631,409
ELECTRO-OPTIC READOUT OF INFORMATION USING A SCHLIEREN OPTICAL SYSTEM
William R. Buchan, Lincoln, Mass., assignor to Itek Corporation, Lexington, Mass.
Filed June 24, 1970, Ser. No. 53,767
Int. Cl. G11c *13/04*
U.S. Cl. 340—173 LM **22 Claims**



Apparatus is disclosed for reading out information present in the form of variations in electric field intensity using a Schlieren system to focus regular wave fronts passing through an electro-optic medium, whose index of refraction varies as a function of an applied electric field, at an opaque spot and to focus disturbed wave fronts, whose distortions are created by variations in the index of refraction of the medium caused by variations in the applied electric field, in the space surrounding that spot to form a representation of the information present in the electric field applied to the medium.

3,631,410
EVENT RECORDER
Bruce M. Velasco, Goleta, Calif., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 3, 1969, Ser. No. 873,529
Int. Cl. G11c *11/36*
U.S. Cl. 340—173 SP **2 Claims**



An apparatus is provided for recording a signal voltage as a function of magnitude and time. The apparatus includes a memory matrix comprising a plurality of diodes connected between different ones of a series of magnitude drive lines and a series of time drive lines. A magnitude input circuit is

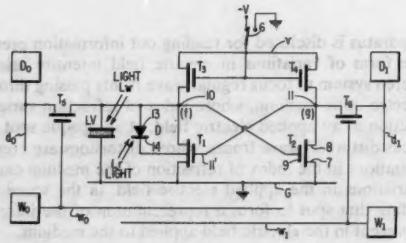
connected with the magnitude drive lines for applying a drive voltage to different ones of the drive lines as a function of the magnitude of the signal voltage. A time input circuit is connected with the time drive lines for coupling different ones of the drive lines to a reference voltage point as a function of time. The drive voltage is substantially greater than the peak voltage rating of the diodes. Therefore, as the drive voltage is applied to the selected ones of the magnitude drive lines and as selected ones of the time drive lines are coupled to the reference voltage point, the diodes connected between the selected ones of the magnitude and time drive lines are burned out or open circuited by the drive voltage. Hence, the pattern of open circuited diodes within the memory matrix provides a representation of the magnitude of the signal voltage as a function of time.

3,631,411

ELECTRICALLY AND OPTICALLY ACCESSIBLE MEMORY

Walter Frank Kosonocky, Skillman, N.J., assignor to RCA Corporation

Filed Oct. 15, 1969, Ser. No. 866,645
Int. Cl. G11c *11/42*
U.S. Cl. 340—173 LS **16 Claims**



A computer memory system is disclosed which includes a randomly and electrically accessible semiconductor "page" memory. The semiconductor page memory is an array of memory units each of which includes an electrically accessible flip-flop for storing a binary information bit. In addition, each flip-flop is provided with a photodiode by which the flip-flop can be set in response to received light, and is provided with a liquid crystal light valve controlled by the electrical state of the flip-flop. The page array of memory units is constructed as a metal oxide semiconductor (MOS) integrated circuit. Each memory unit includes a flip-flop transistor having a drain which is extended over an area of opposite-conductivity material to form a photodiode. A liquid crystal material and a transparent electrode are positioned over the photodiode to form a light vale. The page array of memory units is used as a page-at-a-time electrical input-output unit for a great many pages of information stored optically on an erasable holographic storage medium.

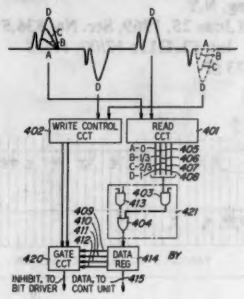
3,631,412

MULTISTATE MAGNETIC CORE MEMORY

Philip A. Harding, Palos Verdes Peninsula, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 27, 1970, Ser. No. 6,132
Int. Cl. G11c *5/02, 11/06, 15/00*
U.S. Cl. 340—174 PA **9 Claims**

A magnetic core memory wherein states of partial magnetization as well as magnetic saturation are employed. In the course of reading information from a core the core is first switched to one extreme state of magnetization to obtain a data readout pulse and subsequently the core is switched to the opposite state of magnetization to obtain a reference data pulse. The ratio of the magnitudes of the reference pulse and the data pulse is measured and is employed to define the state in which the core resided prior to interrogation. Cores are placed in a stable state either a state of partial magnetization or a state of full magnetization, by switching the core from one extreme state of magnetization to the other extreme state of magnetization to obtain a data reference pulse and subsequently the magnitude of this reference pulse is compared with the magnitude of the data pulse which is generated by the writing of new information into the core. The core drive which is employed for writing is terminated when the ratio between the latter data pulse and the reference data pulse has reached a desired ratio.

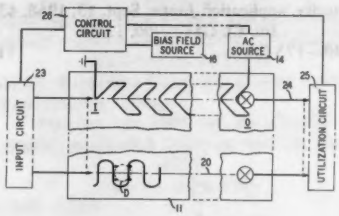


3,631,413

MAGNETIC DOMAIN PROPAGATION ARRANGEMENT

John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 24, 1970, Ser. No. 49,272
Int. Cl. G11b *5/62*
U.S. Cl. 340—174 MC **8 Claims**



A single electrical conductor to which an AC signal is applied causes movement of a single wall domain therealong in a substrate of magnetic material in which such domains can be moved.

3,631,414

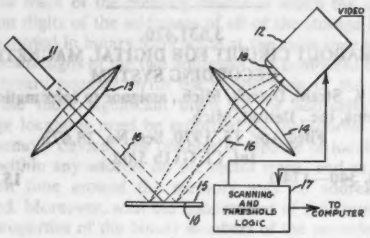
RAPID ACCESS DATA STORAGE AND RETRIEVAL SYSTEM

John E. Bigelow, Niskayuna, N.Y., assignor to General Electric Company

Filed Dec. 30, 1968, Ser. No. 787,699
Int. Cl. G11c *11/14, 11/42*; G02b *5/18*
U.S. Cl. 340—174 YC **12 Claims**

Superimposed angularly oriented diffraction gratings are recorded on sheets of magnetic film to provide high-density data storage on each sheet, each recorded grating representing a particular binary digit. Optical readout is accomplished by diffracting a beam of monochromatic light with the gratings on any selected sheet to produce first order diffraction images in the form of spots on an output plane according

to the binary digits recorded on the sheet. The locations of the spots thus formed on the output plane are indicative of



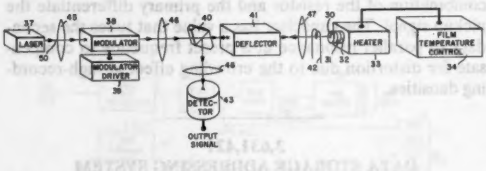
data recorded on the sheet. The sheets may be stacked to provide compact, three-dimensional storage of data.

3,631,415

OPTICAL MASS MEMORY

Roger L. Aagard, Minneapolis; Di Chen, Minnetonka, and Franics M. Schmit, St. Louis Park, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 12, 1969, Ser. No. 857,308
Int. Cl. G11b 7/00; G11c 11/14, 11/42
U.S. Cl. 340—174 YC **11 Claims**



An optical mass memory utilizing the Curie point writing technique wherein information is stored on a manganese bismuth film having low- and high-temperature crystallographic phases. A preheater is utilized to maintain the manganese bismuth film within a temperature range during the quiescent stage of operation in which only the low-temperature crystallographic phase exists. A laser beam provides additional thermal energy to a predetermined film spot to achieve Curie point writing. The stored information is retrieved utilizing the polar Kerr magneto-optic effect.

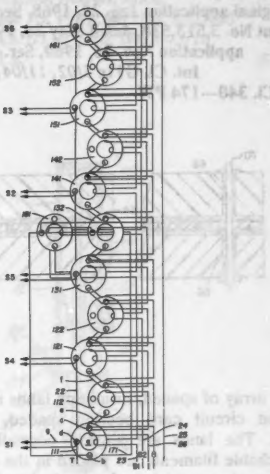
3,631,416

GENERATOR FOR PRODUCING CONTROL IMPULSES FOR STRIKING THE CONTROL-TABLE RECTIFIERS OF A THREE-PHASE INVERTED CONVERTER

Flemming Thorsoe, Augustenberg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Oct. 6, 1969, Ser. No. 864,571
Int. Cl. G11c 19/00, 11/08
U.S. Cl. 340—174 SR **3 Claims**

The invention relates to a generator for producing control signals for striking the controllable rectifiers of a three-phase inverted converter having common quenching means. The generator is a slide-type impulse-storing type of device which is actuated in synchronism with quenching impulses and has six bistable stages. The output of the third stage is applied to the input of the first stage by way of an inverter. Each stage is associated with one of the controllable rectifiers and the



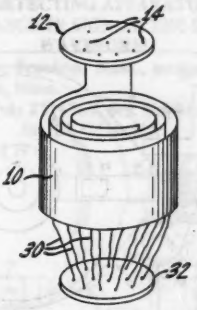
control signals transmitted are dependent upon the switching conditions of the stages.

3,631,417

CYLINDRICAL MAGNETIC MEMORY CONSTRUCTION

Willis Edward Golder, Holliston, and John Pellegrino, Saugus, both of Mass., assignors to RCA Corporation

Filed Nov. 18, 1969, Ser. No. 877,805
Int. Cl. G11c 11/06, 5/04
U.S. Cl. 340—174 MA **6 Claims**

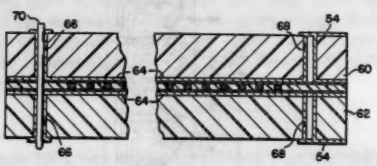


A magnetic core memory construction, and method of construction, is disclosed in which selection diodes and magnetic core memory arrays are mounted on an elongated flexible web. The web has printed conductors thereon having external connection terminals and internal connection terminals. The diodes and memory wires are connected to internal connection terminals. The flexible web assembly is rolled into a cylindrical shape and enclosed in a container having an end cap that includes a multiterminal connector for connections to the external connection terminals of the flexible web. The container is filled with an insulating liquid. Expansion and contraction of the liquid is accommodated by an internal bellows which is vented on one side to the atmosphere.

3,631,418
FILAMENTARY MAGNETIC MEMORY

Thaddeus F. Bryzinski, West Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Original application Jan. 22, 1968, Ser. No. 699,673, now Patent No. 3,513,538, dated May 26, 1970. Divided and this application Nov. 26, 1969, Ser. No. 880,188
Int. Cl. G11c 5/02, 11/04, 11/14
U.S. Cl. 340—174 PW 1 Claim

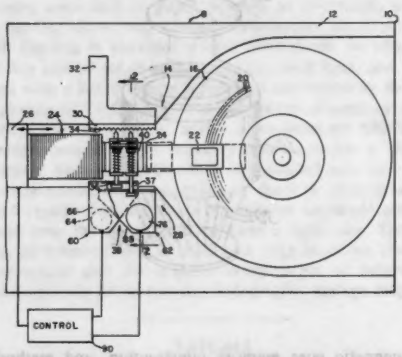


An array of spaced, insulating lands in cast in situ upon a printed circuit card bearing spaded, parallel conductive strips. The lands are aligned normally across the strips. Stretchable filaments are placed in the grooves between the lands, and a second card, identical to the first is cemented upon the array of lands in opposed registration with the first card. The filaments are pulled out, leaving elongated apertures to receive filamentary magnetic memory elements. Connections are made through the cards to the conductive strips by any convenient means such as by electroplating through holes to connect the strips to an external circuit.

3,631,419
APPARATUS FOR THE VIBRATION-FREE POSITIONING OF MOVABLE COMPONENTS

Bin-Lun Ho, Los Gatos, Calif., assignor to Iomec Incorporated, Santa Clara, Calif.

Filed Apr. 10, 1970, Ser. No. 27,277
Int. Cl. G11b 21/08; H01f 7/16
U.S. Cl. 340—174.1 C 13 Claims

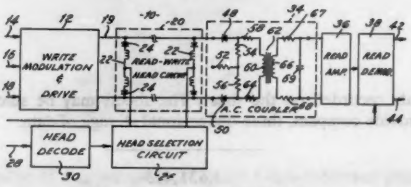


Apparatus for positioning a carriage which is movable along a predetermined path by mounting a toothed rack parallel to the carriage movement, and engaging predetermined indentations of the rack with a plunger mounted to the carriage for movement in a direction perpendicular to the carriage movement. Means for moving the plunger into engagement with the rack is mounted to the apparatus base so that inertial forces upon acceleration and deceleration of the plunger are transmitted between the actuating means and the rack and the carriage is isolated from forces acting transversely to its direction of movement whereby lateral vibrations of the carriage due to inertial forces are eliminated.

3,631,420
READOUT CIRCUIT FOR DIGITAL MAGNETIC RECORDING SYSTEM

Gerald K. Strehl, Detroit, Mich., assignor to Information Data Systems, Inc., Detroit, Mich.

Filed Apr. 15, 1970, Ser. No. 28,673
Int. Cl. G11b 5/02
U.S. Cl. 340—174.1 15 Claims

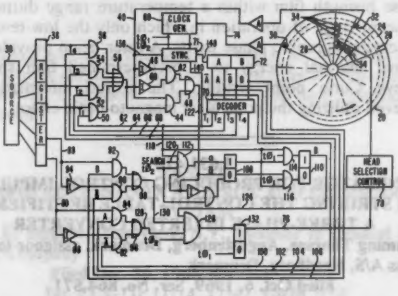


A readout circuit for phase-modulated data recorded on magnetic storage media wherein the playback signal developed by the playback heads is processed through a passive circuit comprising a resistor connected in series between the head and the primary of a ferrite core transformer. A capacitor is connected in parallel with the secondary of the transformer. The resistor has a value such that the series combination of the resistor and the primary differentiate the pickup signal. The capacitor has a value that tunes the secondary to parallel resonance at a preset frequency to compensate for distortion due to the crowding effect at high-recording densities.

3,631,421
DATA STORAGE ADDRESSING SYSTEM

Cornelius C. Perkins, Birmingham, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 23, 1968, Ser. No. 775,971
Int. Cl. G11b 27/32
U.S. Cl. 340—174.1 J 20 Claims



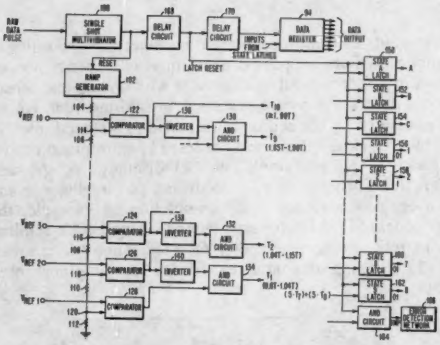
This invention relates broadly to addressing memory systems for the recording and the retrieval of information therein, and more particularly to a new and improved method of and apparatus for addressing a cyclically movable data storage member, such as a rotatable magnetic disk,

capable of locating every bit time thereof and of detecting and correcting any nonsynchronous relation between certain operating and timing signals. The more significant digits of the address of the wanted location are compared against an address track of the memory device in which the more significant digits of the addresses of all of the storage locations are recorded in binary form while at the same time the lesser significant digits of the two addresses are compared by means of a binary counter. With the cooperation of the counter, only the more significant digits of the addresses for the storage locations need be recorded on the address track of the memory device. The counter is capable of locating each digit within any address on the sector track, and as a result, any bit time around the memory may be addressed and located. Moreover, with the cooperation of the counter, certain properties of the binary numbers of the recorded sector track addresses are taken advantage of for synchronizing the operation of the system, and means is provided for detecting any out-of-phase relation between counter and timing signals that might develop and for automatically bringing these signals back into synchronization within a limited distance of movement of the memory device.

3,631,422
SYSTEM FOR DETECTION OF DATA BY TIME INTERVAL MEASUREMENT

William F. Krajewski, Los Gatos; Marco Padalino, and David H. Paulson, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1969, Ser. No. 795,920
Int. Cl. G11b *5/04*
U.S. Cl. 340—174.1 G **17 Claims**

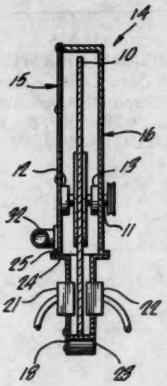


A system is provided in which data processed in digitally encoded form is detected using an inverse algorithm of the encoding process and the predictable nature of errors which may be introduced by the processing media. In one example, a measurement of the time interval between each adjacent pair of data signal transitions derived from a magnetic recording media is adjusted to compensate for speed variations of the recording media, and the adjusted measurement is categorized according to the predictable nature of bit shift introduced by the recording media. Logic circuitry responds to each categorized time interval measurement to determine the data denoted thereby in terms of data detected from the immediately preceding time interval.

3,631,423
SELF-PURGING DISK SYSTEM

Robert George Groom, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 13, 1969, Ser. No. 832,930
Int. Cl. G11b *5/40;* **B01d** *45/18*
U.S. Cl. 340—174.1 E **5 Claims**

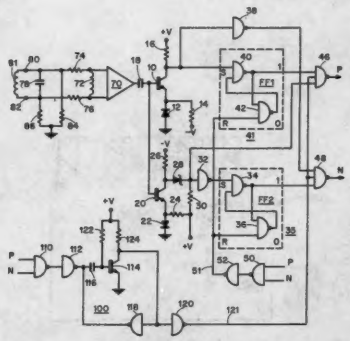


A closed system designed to have a minimum, and preferably no foreign particles in its interior, includes an enclosure housing a rotating mass which develops pressure differentials in the fluid enclosed in the housing. A conduit having a filter therein for collecting particles over a selected size connects an outlet port with an inlet port which are located adjacent areas of high pressure and low pressure, respectively, with the difference in pressure being sufficient to carry the particles through the conduit with the fluid movement therethrough.

3,631,424
BINARY DATA DETECTING APPARATUS RESPONSIVE TO THE CHANGE IN SIGN OF THE SLOPE OF A WAVEFORM

William M. Regitz, Franklin, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed July 22, 1969, Ser. No. 843,724
Int. Cl. G11b *5/02*
U.S. Cl. 340—174.1 H **13 Claims**



In a magnetic recording system wherein a playback waveform is induced in a read transducer, detecting ap-

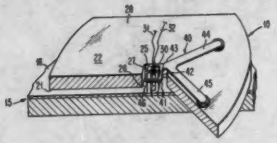
paratus adapted to sense the occurrence of positive and negative voltage peaks of the playback waveform. The detecting apparatus includes first and second semiconductor active elements of opposite types, one capable of conduction during a positive-going transition of the playback waveform, while the other is capable of conduction during a negative-going transition of the playback waveform. Logic means are also included and adapted to connect to the output of the first and second semiconductor active elements.

3,631,425

MAGNETIC HEAD SLIDER WITH ORIFICE

Tung-Men Tang, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,630
Int. Cl. G11b *5/10, 2/120*
U.S. Cl. 340—174.1 E **4 Claims**



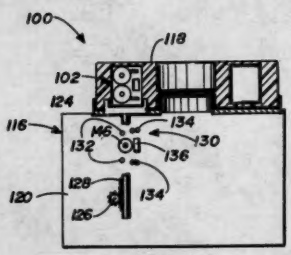
A magnetic head assembly is disclosed for cooperating in transducing relation with a moving magnetic medium. The assembly comprises a slider having an air-bearing surface, a magnetic transducer, and resilient means for mounting the transducer to the slider and for providing relative movement between the transducer and the slider. The slider has an orifice therethrough defining an aperture in the air bearing surface. In view of the pressure differential between the air bearing surface and the other surface of the slider, contaminants are urged through the orifice and out of the slider.

3,631,426

INFORMATION STORAGE SYSTEM HAVING MASTER AND REDUNDANT DATA ON TAPE IN TURRET SUPPORTED CARTRIDGES

Daren R. Appelt, Houston, Tex., and Granville E. Ott, Columbia, Mo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1969, Ser. No. 888,337
Int. Cl. G11b *5/02, 23/08*
U.S. Cl. 340—174.1 B **6 Claims**



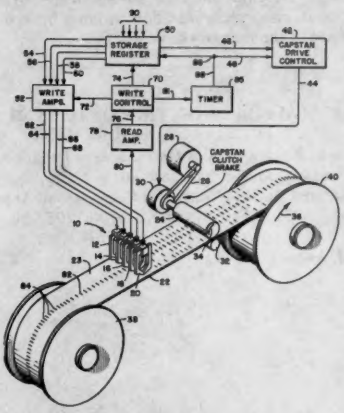
In a information storage system, a turret supports a plurality of cartridges which in turn enclose individual lengths of magnetic tape. The turret rotates the cartridges to an apparatus that selectively transfers the cartridges to an information recording/reproducing station. At the station, phase modulated data is simultaneously recorded along 32 master data tracks. At the same time, the same data is encoded and recorded along 32 redundant tracks. During reproduction, all 64 tracks are read simultaneously. Data from the master data tracks is selected unless a parity error occurs, whereupon data from the corresponding redundant track is used.

3,631,427

INCREMENTAL TAPE DRIVE CONTROLLED BY PRERECORDED CLOCK TRACK

Richard A. Hein, Skokie; Mark A. Hunter, Evanston, and Alf J. Olsen, Elk Grove Village, all of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Dec. 30, 1969, Ser. No. 889,099
Int. Cl. G11b *15/18;* **B65h** *17/22*
U.S. Cl. 340—174.1 A **6 Claims**



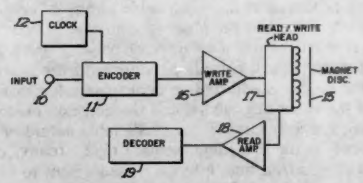
A plurality of electromagnetic transducers for recording in magnetic medium supported on a moveable carrier are arranged in a record head in alignment with a magnetic sensor which is responsive to a clock track in said medium. An effect generated by the sensor in response to a sensed mark in the clock track simultaneously orders (1) transmission of intelligence to writing amplifiers, (2) discharge of the amplifiers to said transducers for recording said intelligence and (3) cycling of a timer. Upon completion of its cycle, the timer orders (1) drive to the carrier terminated for reinitiation in response to availability of intelligence for recordal and (2) resetting of a data register for receiving new intelligence.

3,631,428

QUARTER-HALF CYCLE CODING FOR ROTATING MAGNETIC MEMORY SYSTEM

Wayne J. King, Leucadia, Calif., assignor to Pacific Micronetics, Inc., San Diego, Calif.

Filed Nov. 19, 1968, Ser. No. 805,916
Int. Cl. G11b *5/04*
U.S. Cl. 340—174.1 G **11 Claims**



A system for coding information in a rotating magnetic memory, the system having means for representing, for ex-

ample, a "1" by a one-half cycle portion of a wave such as a rectangular wave, and having a given frequency, and representing a "0" by one-quarter portion of a similarly shaped wave having the same amplitude but only half the frequency of the first wave.

3,631,429

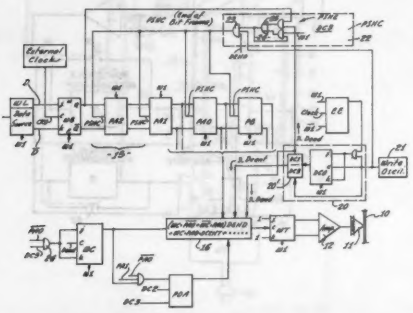
SYSTEM FOR REPRODUCIBLY STORING DIGITAL DATA

Wayne J. King, Leucadia, Calif., assignor to Pacific Micronetics, Inc., San Diego, Calif.

Continuation-in-part of application Ser. No. 805,916, Nov. 19, 1968. This application Aug. 6, 1969, Ser. No. 847,831

Int. Cl. G11b *5/06*

U.S. Cl. 340—174.1 G **16 Claims**



A system is disclosed for recording digital data on a magnetic storage surface and in sequential bit frames thereof. A "zero" is recorded by placing a transition on but one of the two frame boundaries of a bit frame. A "one" is recorded by placing a transition on both boundaries or in the center of the frame. The selection of transition placement is made dependent upon an odd-even count of recorded "zeros." Upon readback, the delay between sequential readback peaks may be about one, one and a half or two frame periods, and the data are reconstructed from these delays in that a delay of a frame period represents a one, a delay of two frame periods represents two "zeros," and a delay of one and a half frame periods is alternatingly interpreted as a "zero," followed by a "one," or as a single "zero." Bit crowding and signal rise time problems are counteracted by predistorting the placement of transitions during recording.

3,631,430

POSITION-RESPONSIVE APPARATUS

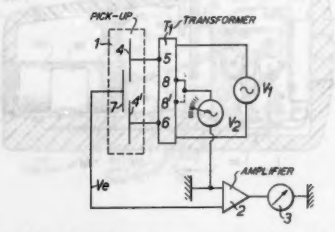
Gordon Maurice West, Kirkcaldy, Scotland, assignor to The Rank Organisation Limited, London, England

Filed Jan. 29, 1969, Ser. No. 795,003

Claims priority, application Great Britain, Feb. 12, 1968, 6,842/68

Int. Cl. G08c *19/00*

U.S. Cl. 340—200 **28 Claims**



An apparatus for determining the relative position of two members in which a voltage from an adjustable supply is used to match the output voltage of a pickup device sensitive to the relative position of the members. The degree of adjustment necessary to provide the match is used as an indication of the relative position.

3,631,431

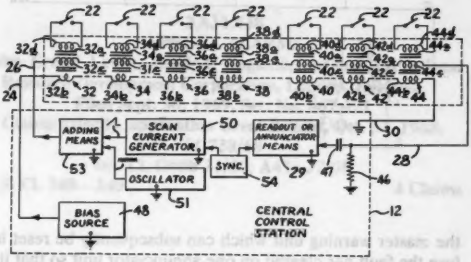
EVENT-MONITORING SYSTEM

Jay A. Cox, Rolling Hills Estates, Calif., assignor to Gulton Industries, Inc., Metuchen, N.J.

Filed May 27, 1969, Ser. No. 828,247

Int. Cl. G08b *25/00*

U.S. Cl. 340—213 **11 Claims**



An event-monitoring system including saturable core devices having respective separate saturable cores most desirably each carrying a biasing winding and a scanning winding, the biasing windings being connected in series with one another and the scanning windings being connected in series with one another. The biasing windings of the saturable core devices have different numbers of turns so an instantaneous predetermined magnitude of biasing current will saturate the cores to progressively increasing degrees. The series connected scanning windings receive a scanning current of progressively increasing value, which most advantageously have an AC component superimposed thereon, to develop an oppositely directed progressively increasing electromagnetic field sequentially to unsaturate the cores at predetermined current values normally to cause sequential electrical output signals to be generated thereby, the interval during which unsaturation occurs being a large number of cycles at the modulating frequency. Associated condition-responsive switch means are connected to each saturable core device, such as across each scanning windings, or preferably across a separate isolation winding, so closure of the switch means will prevent the generation of said output signal.

3,631,432

ANNUNCIATOR UNIT FOR USE IN A FAULT WARNING SYSTEM

John Stallebrass, 15 Adam and Eva Mews, London, W. 8, England

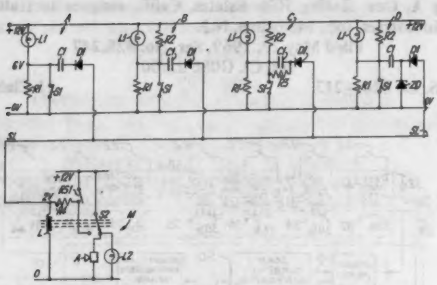
Filed Jan. 14, 1970, Ser. No. 2,868

Int. Cl. G08b *19/00, 25/00*

U.S. Cl. 340—213.1 **11 Claims**

The invention is concerned with annunciator units for use in electrical fault warning systems which can indicate whether certain parameters of a number of pieces of equipment lie within acceptable operating limits or not. The unit comprises a visual indicator and a switch which is normally open but which is arranged to be closed upon a fault occurring and thus causing the visual indicator to be energized. The switch is connected to one side of a capacitor the other side of which is connected through a blocking diode to a signal output for connection to a signal line. The arrangement is such that when the switch is closed the potential on the one side of the capacitor is changed so that an additional charge is drawn as a pulse through the diode to or from the

signal line from or to the other side of the capacitor. In use a number of annunciator units are connected to a common master warning unit through common or parallel signal lines and the appearance of the pulse in the signal line operates



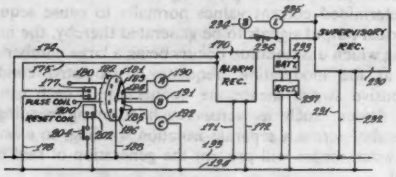
the master warning unit which can subsequently be reset before the fault has cleared on one annunciator unit so that it is ready to indicate a fault appearing on another annunciator unit.

3,631,433

DETECTION AND ALARM SYSTEM

Keith M. Dix, Bannockburn, Ill., assignor to Fire Protection Company

Filed Sept. 15, 1969, Ser. No. 857,882
Int. Cl. G08b *1/08*
U.S. Cl. 340—216 **23 Claims**



A fire detection and alarm system for sensing a dangerous fire or like condition in one part of a building or the like and providing an alarm signal at a remote location in the building, by means of high-frequency carrier signals superimposed on the existing wiring, including a fire detection transmitter for sensing fire and transmitting at one frequency, a receiver responsive to signals from the fire transmitter for actuating an alarm, a normally energized supervisory transmitter adjacent the fire-detecting transmitter and operative at a second frequency for sensing circuit failure, and a supervisory receiver at the remote location responsive to signals from the supervisory transmitter for actuating an alarm on power failure when the supervisory transmitter stops sending.

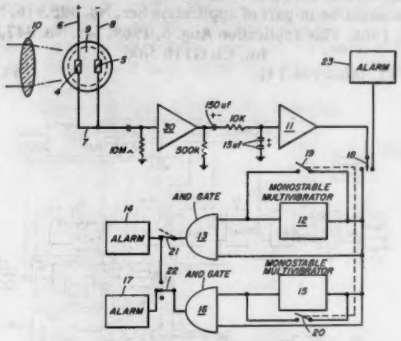
In an alternative embodiment for use in a large building involving many different widespread areas, a separate fire detection transmitter is provided in each area in association with a stepping relay which identifies the area, and an annunciator at the remote alarm location includes a single stepping relay for selectively energizing indicators not only warning of fire or the like but also showing the location.

3,631,434

PASSIVE INTRUSION DETECTOR

Frank Schwartz, Stamford, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 564,391, July 11, 1966, now abandoned. This application Oct. 8, 1969, Ser. No. 864,842
Int. Cl. G08b *13/18*; H01j *39/00*
U.S. Cl. 340—228 **13 Claims**



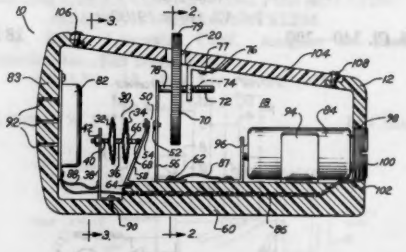
A passive intrusion detector is described with two stationary detectors or detector elements arranged side by side and stationary optics which image a target onto the plane of the detector. The output of the two detectors or detector elements, which are in opposition, is processed in electronic circuits involving differentiation so that there will be no final output unless the image of the target moves onto and off a detector or, in one modification, from one detector to the other. The electronics can also indicate the direction of the movement. The detector is aimed at an area where an intruder may enter, for example, a path through the jungle, and signals by the infrared radiation of the target that moves into the area or across it actuate an alarm.

3,631,435

TORNADO SENSING DEVICE

George H. Elenbaas, 814 Hiawatha Drive, Elkhart, Ind.

Filed May 2, 1968, Ser. No. 726,096
Int. Cl. G08b *21/00*
U.S. Cl. 340—236 **5 Claims**



A tornado warning device in which an electrical signal means is controlled by an electric circuit having a switch

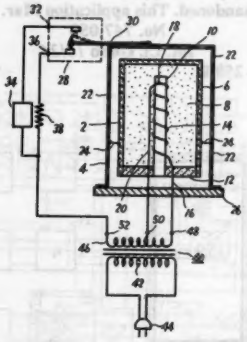
responsive to barometric pressure and a means for adjusting the switch to compensate for normal changes in barometric pressure. The adjustment means can readily be set and the circuit tested after a condition favorable for tornadoes has been reported or observed.

3,631,436

GAS-DETECTING DEVICE

Naoyoshi Taguchi, 1-2 Ikedauemachi Nagata-ku, Kobe, Japan

Filed July 14, 1970, Ser. No. 54,743
Int. Cl. G08b *21/00*; G01n *31/06*
U.S. Cl. 340—237 **6 Claims**



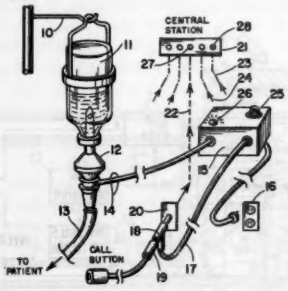
A gas-detecting device having a gas responsive semiconductor, a pair of electrodes in contact with the semiconductor, means for heating the semiconductor to stabilize its resistance at a predetermined value, time delay switching means and an alarm circuit and an impedance circuit interconnected with said electrodes and said switching means so that the impedance circuit will be connected with the semiconductor electrodes during the heating period and upon stabilization of the semiconductor the switching means will automatically and effectively disconnect the impedance circuit and substitute the alarm circuit.

3,631,437

INTRAVENOUS FEEDING MONITORING SYSTEM

Duncan Campbell, 312 Peach Grove Lane, and Alexander Donald, 4120 Cresta Avenue, both of Santa Barbara, Calif.

Filed July 24, 1969, Ser. No. 844,444
Int. Cl. G08b *19/00*; A61m *5/16*
U.S. Cl. 340—239 R **5 Claims**



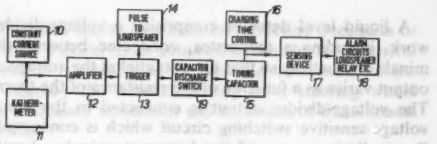
A drop rate generator is connected to conductors imbedded in the drop chamber of an intravenous feeding system to generate a series of electrical pulses of frequency corresponding to drop rate. These pulses are fed into an electrical circuit including a logic circuit means for actuating an alarm at a central station when the frequency of the pulses and thus the drop rate is less than a first predetermined frequency or greater than a second predetermined frequency higher than the first predetermined frequency. The first and second predetermined frequencies define a tolerable or acceptable range of frequency variation in the drop rate such that no alarm signals are generated so long as the drop rate is within this range. The system also includes a fluid level indicating means responsive to the lowering of the fluid level in the intravenous feeding bottle below a predetermined level for actuating an alarm at the same remote location.

3,631,438

APNOEA ALARMS

John Ernest Lewin, London, England, assignor to National Research Development Corporation, London, England

Filed Sept. 30, 1969, Ser. No. 862,421
Claims priority, application Great Britain, Oct. 31, 1968, 51,738/68
Int. Cl. G08b *21/00*; A47c *27/08*
U.S. Cl. 340—240 **4 Claims**



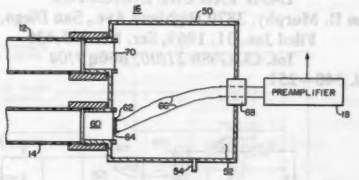
An apnoea alarm comprises a compartmented air mattress the individual compartments of which are connected to a common chamber containing a anemometer. The anemometer is connected to an electronic circuit which gives an alarm after a preset time if there is no airflow over the katherometer due to movement of the mattress caused by a breathing baby lying on it.

3,631,439

PRESSURE-SENSITIVE SECURITY APPARATUS

Edward W. Nichols, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 15, 1969, Ser. No. 857,961
Int. Cl. G08b *13/20*; H01h *35/34*
U.S. Cl. 340—240 **1 Claim**

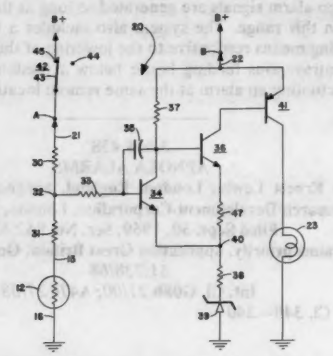


A pressure-sensitive security signal apparatus of the type in which a receiving transducer responds to pressure applied to fluid-filled tubes by developing an electrical signal which is a function of the applied pressure. More particularly the invention is directed to a pressure-sensitive security signal apparatus comprising two fluid-filled tubes and a single pressure transducer means for developing an electrical signal as a function of the difference in pressures applied to each of the fluid-filled tubes.

3,631,440
LIQUID LEVEL DETECTOR

Arnie L. Cliffgard, 9268 Daisey Avenue, Fountain Valley, Calif.

Filed July 7, 1969, Ser. No. 839,322
Int. Cl. G08b *21/00*; B60q *1/00*
U.S. Cl. 340—244 C **6 Claims**

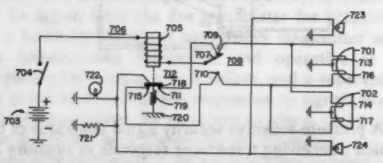


A liquid level detector comprising a voltage-divider network, including a thermistor, connected between the terminals of a battery so that the potential at the voltage-divider output varies as a function of the resistance of the thermistor. The voltage-divider output is connected to the input of a voltage-sensitive switching circuit which is connected via a Zener diode to one of the battery terminals whereby the Zener diode provides a reference voltage level which is independent of current and battery voltage fluctuations. The voltage-sensitive switching circuit has two stable states and is either in one state or the other depending upon whether the potential at the voltage-divider output is above or below the reference level provided by the Zener diode. When the potential at the voltage-divider output indicates that the thermistor is out of a good heat conductor such as a liquid, the switching circuit closes a series circuit between the battery and a lamp so that the lamp provides a visual indication of the low liquid level condition. According to a preferred embodiment of the invention, the reference voltage level provided by the Zener diode has first and second discrete, controllable values depending upon whether the potential at the voltage-divider output is greater or less than the reference level provided by the Zener diode to permit independent control of the activation and deactivation of the lamp.

3,631,441
LAMP FAILURE INDICATOR

Herman H. Murphy, 3870 Highland Ave., San Diego, Calif.

Filed Jan. 31, 1969, Ser. No. 795,439
Int. Cl. G08b *21/00*; B60q *1/04*
U.S. Cl. 340—251 **2 Claims**

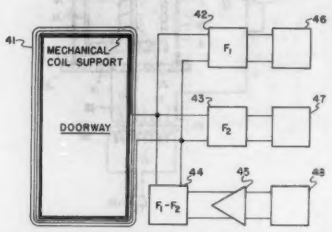


A circuit arrangement for monitoring the normal operation of the headlamp filaments in an automotive vehicle comprising an interrupter device connected in an electrical circuit with the headlamp filaments and a power supply, the interrupter device being inhibited from functioning as an active interrupter by a normally functioning filament. Upon failure or other abnormality in the headlamp circuit, the device is enabled to function as an active interrupter to produce an audible indication characteristic of a buzzer or horn and, optionally, to provide a visual indication of the failure to the driver. According to the preferred embodiment of the invention, when functioning as an active interrupter, the present device intermittently connects an alternate filament into the circuit to substitute for the failed filament to thereby visually signal distant observers of the failure.

3,631,442
ANTI-SHOPLIFTING SYSTEM

Robert E. Fearon, 530 S. Lewis, Tulsa, Okla.

Continuation-in-part of application Ser. No. 680,666, Nov. 6, 1967, now abandoned. This application Mar. 22, 1968, Ser. No. 747,050
Int. Cl. G08b *13/24*
U.S. Cl. 340—258 R **5 Claims**

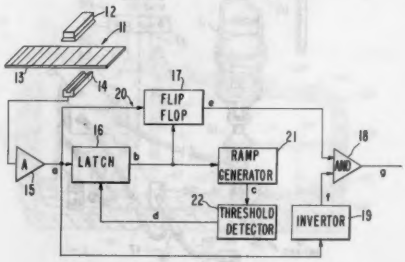


Article theft detection system wherein a passive nonlinear radio transponder is attached to each article to be protected, and an exit way is monitored by a loop antenna which is energized by currents of two different frequencies. The transponders radiate the difference frequency when subjected to a field of the two energizing frequencies. Receiving means connected to the loop antenna detects signals having a frequency equal to the difference between the two energizing frequencies, and actuates an alarm.

3,631,443
UNSAFE VELOCITY DETECTION SYSTEM

Martin O. Halfhill, and Timothy W. Martin, both of San Jose, Calif., assignors to Information Storage Systems, Inc., Cupertino, Calif.

Filed July 18, 1969, Ser. No. 842,942
Int. Cl. G08b *5/22*
U.S. Cl. 340—263 **4 Claims**



An unsafe velocity detection system for use with a servo-controlled actuator connected to a movable load, including a

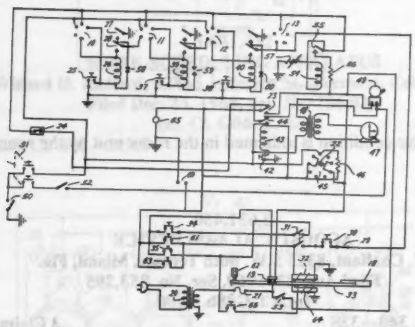
transducer for generating a signal indicating traverse by the load of a predetermined increment of the effective working area of the load, circuitry for developing a time-based signal from the traverse signal and means for comparing the traverse signal with the time-based signal to detect any excessive velocity condition.

3,631,444

ELECTRIC PERMUTATION LOCK AND ALERTING SYSTEMS

Don Harold Daniel, 5114 Huisache, Bellaire, Tex.

Filed July 22, 1968, Ser. No. 754,154
Int. Cl. G08b *19/00*
U.S. Cl. 340—274 **5 Claims**



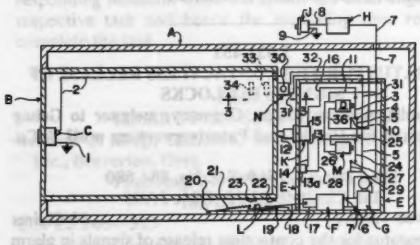
A composite door lock security system in which a door-unlocking combination function is provided through electric screening of outside-switch-generated signals. A preselected and changeable unlock combination is allowed to pass to an unlock solenoid while any erroneous unlock signals, burglar detection and community alert signals are channeled to the lock reset and to one or both of two alarm circuits which sound, register and identify the above source signals plus fire detection signals. Simple switch and manual lock-unlock means are also provided.

3,631,445

BURGLAR ALARM AND LOCKING DEVICE FOR DRAWER

Alfred G. Shew, 6449 Hazel Avenue, Richmond, Calif.

Filed Dec. 9, 1969, Ser. No. 883,480
Int. Cl. G08b *13/08*
U.S. Cl. 340—274 **4 Claims**



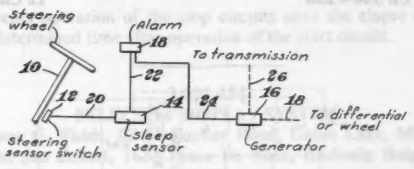
A burglar alarm and locking device for a key-locked drawer for holding valuables in which the burglar alarm is activated as soon as an unauthorized person tries to forcibly open the drawer without using the required key. Automatic drawer locking means is also actuated for preventing the drawer from being forced open to an extent where the unauthorized person can remove valuables such as currency from the drawer. This same means will prevent the drawer from being completely closed by the unauthorized person.

3,631,446

SLEEP-SENSING DEVICE FOR USE ON AUTOMOTIVE VEHICLES

Donald D. Setser, 1901 S. Fulton, Tulsa, Okla.

Filed Aug. 12, 1968, Ser. No. 751,984
Int. Cl. G08b *21/00*
U.S. Cl. 340—279 **5 Claims**



This invention relates to means for detecting sleepiness or drowsiness in a driver of an automotive vehicle. An electrical sensing switch is coupled to the steering mechanism of the vehicle whereby the normal moving of a steering wheel results in frequency movement and actuation of the contacts of the switch.

Actuation of the multicontact switch either charges a charge transfer condenser or, depending on movement of the vehicle's steering wheel, transfers the charge of the transfer condenser to a rate or counter circuit whose output is coupled a relay which when deactivated, for example, actuates an alarm powered by voltage generated by means coupled to the drive means of an automotive vehicle.

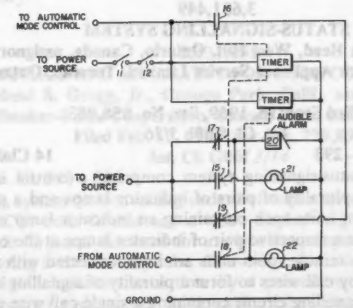
Lack of normal steering movement results in the deactivation of the relay and actuation of the alarm when predetermined speed of the vehicle occurs.

3,631,447

SAFETY ALARM

Raymond J. Sulat, West Caldwell, and Moses W. Hunt, Newark, both of N.J., assignors to Hudson Tool & Die Co., Inc., Newark, N.J.

Filed July 11, 1969, Ser. No. 841,048
Int. Cl. H01h *47/22*
U.S. Cl. 340—279 **7 Claims**



A safety alarm for machines having an "automatic" mode of operation comprising a pair of timers actuated by manually operable switches, the said timers connected in se-

ries to prevent the machine from converting to the "automatic" mode of operation until both have timed-out and requiring the uninterrupted manual actuation of said switches during the period of timeout, and audible alarm means energized continuously while the machine is set for "automatic" mode of operation, the said alarm means being deenergized when both timers have timed out.

3,631,448

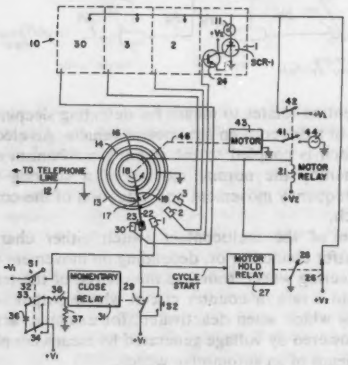
MULTIPLE STATION INTERCOMMUNICATIONS SYSTEM

John M. Leslie, Portola Valley, Calif., assignor to Havalex, Inc., Redwood City, Calif.

Continuation-in-part of application Ser. No. 624,008, Mar. 17, 1967, now abandoned. This application Apr. 26, 1968, Ser. No. 724,388

Int. Cl. G08b *5/00*; **H04q** *3/00*

U.S. Cl. 340—286 **12 Claims**



A system interconnecting several stations, each having one of two conditions which it is desired to communicate to all stations so that the conditions of all stations is indicated at each station. A plurality of indicators, one for each station, are at each station, and have an energized and deenergized state for indicating the conditions of the corresponding stations. Silicon controlled rectifiers maintain the energized condition of energized indicators. Each station is sequentially scanned in response to a change in condition of any one of the stations.

3,631,449

STATUS-SIGNALLING SYSTEM

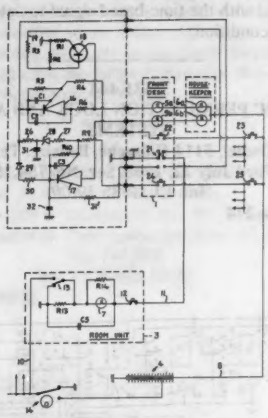
William John Head, West Hill, Ontario, Canada, assignor to Electro Tech Appliance Service Limited, Toronto, Ontario, Canada

Filed Sept. 18, 1969, Ser. No. 858,983

Int. Cl. G08b *5/36*

U.S. Cl. 340—293 **14 Claims**

A room-status-signalling system comprises a central unit containing a plurality of pairs of indicator lamps and a plurality of room units each containing an indicator lamp corresponding to a respective pair of indicator lamps at the central unit. The remote room units are interconnected with the central unit by call wires to form a plurality of signalling circuits, each signalling circuit containing a single-call wire and including switching means at the remote unit and the central unit for selectively energizing the lamps in accordance with a sequence of room status conditions to be signalled. By selectively energizing one or other of the lamps of any pair, with steady or intermittent current, a number of signals are made available to indicate the different status conditions, and the



particular condition is indicated in the room unit by the room lamp.

3,631,450

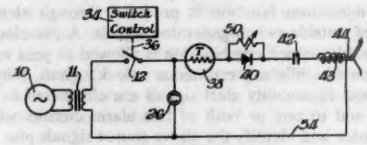
ACOUSTIC ALARM DEVICE

John W. Chalfant, 8325 S.W. 86th Terrace, Miami, Fla.

Filed Aug. 27, 1969, Ser. No. 853,295

Int. Cl. G08b *23/00*

U.S. Cl. 340—328 **3 Claims**



A loudspeaker is adapted to be energized by an alternating current signal to provide an audible output signal of progressively increasing intensity. An alarm controlled switch applies the signal to a loudspeaker. The increase in intensity of the audible signal is facilitated by a thermistor connected in series with the loudspeaker. A high-pass filter and rectifier circuit in series with the thermistor enhance the production of harmonics of the signal frequency thereby to provide an improved audio tone and to permit said tone, or alarm signal, to be readily heard over a broad intensity range. A vibrator attached to the speaker provides a second audible signal after a predetermined audio intensity is achieved.

3,631,451

APPARATUS FOR THE CONTACTLESS RELEASE OF SIGNALS IN CLOCKS

Karl Schmitt, Achern, Baden, Germany, assignor to Gehap Gesellschaft fur Handel und Patentverwertung mbH &/Co. KG.

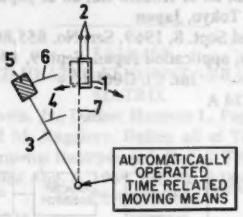
Filed Dec. 12, 1969, Ser. No. 884,680

Int. Cl. G04b *23/00*; **G04c** *21/00*

U.S. Cl. 340—309.1 **10 Claims**

An apparatus for the contactless release of signals in alarm clocks, signal clocks, timers for electrical appliances, start-stop time switches, short-time bells, or the like, comprising in the area of a release mechanism which is actuated by the clockwork at least one magnetic-field-dependent resistor

connected to an electronic control circuit, and a magnetic field that changes by reason of the release mechanism being



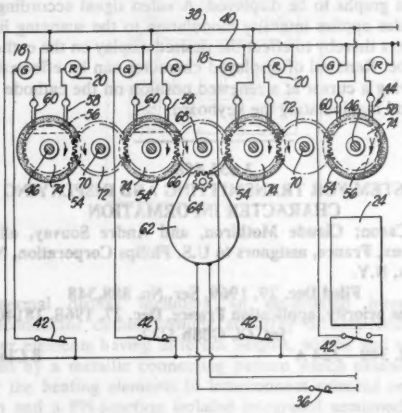
caused to act on this resistor when the signal is released in the desired manner.

3,631,452

WORK-SCHEDULING APPARATUS

Willard H. Richard, 42865 Jefferson St., Fremont, Calif.

Filed Dec. 23, 1968, Ser. No. 786,029
Int. Cl. G04c *23/00*
U.S. Cl. 340—309.5 **3 Claims**



Work-scheduling schedulaing apparatus for indicating the status of a number of work-performing media which may be either men or machines. The scheduling apparatus embodies a number of indicator sets to be associated with the work-performing media, respectively, whose work is to be scheduled. Each indicator set includes a first indicator for indicating the availability of the corresponding work-performing medium to perform its respective task and a second indicator for indicating the period of time which the corresponding medium, when occupied, has been engaged in its respective task and hence the remaining time required to complete the task.

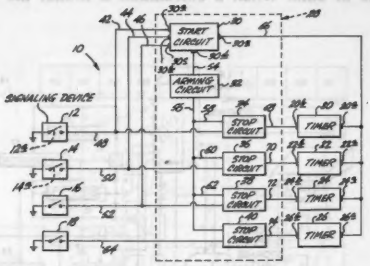
3,631,453

TIMER START-STOP APPARATUS

Bernard J. Stalp, Hillsboro, Oreg., assignor to Data Time, Inc., Beaverton, Oreg.

Filed Aug. 21, 1970, Ser. No. 65,928
Int. Cl. G06m *3/06*
U.S. Cl. 340—323 **7 Claims**

Electronic circuitry for controlling from the actions of one or more hand-operated signaling devices the starting and stopping of one or more electrical timers employed to time the performances of participants in sporting and like events. The circuitry employs a start circuit, and separate therefrom a different stop circuit for each participant. Interposed between the start and stop circuits is an arming circuit which



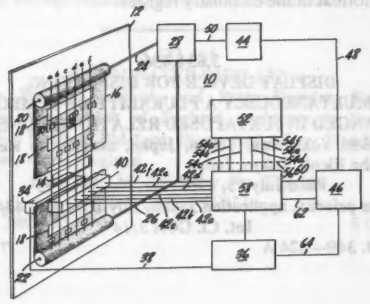
prevents operation of the stop circuits until the elapse of a predetermined time after operation of the start circuit.

3,631,454

SELECTIVE DISPLAY SYSTEM

Delmar G. Fields, 82-51 Foxbay Road, Union Lake, Mich., and Jon Eckert, 1633 Paseo De Roca, Hacienda Heights, Calif.

Filed Oct. 23, 1969, Ser. No. 13,914
Int. Cl. G08b *5/22*
U.S. Cl. 340—324 R **9 Claims**



A system for selectively displaying symbols contained on a display curtain involving the noncontiguous sensing of identifiers associated with each symbol and continuous comparison of sensed identifiers with a command identifier indicative of a symbol desired to be displayed, said comparison being performed by nonretentive parallel parity detection circuitry.

3,631,455

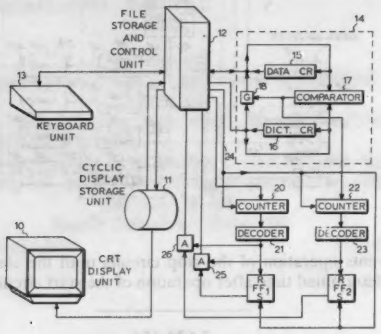
METHOD AND APPARATUS FOR CODE CONVERSION

Roland S. Gregg, Jr., Canoga Park, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Feb. 13, 1969, Ser. No. 798,896
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **20 Claims**

A system for converting codes between a system data (e.g., ASCII) code format and a video display (e.g., dot matrix) code format is disclosed for use in a data display system employing a cathode-ray tube. Conversion is accomplished one line of characters at a time by a procedure in which the character code groups to be converted (system to video or video to system) are circulated in a register in synchronism with a "dictionary" consisting of a series of all possible character code groups, each with its related code group of the other format. The circulating register for the dictionary is

shorter than the register for the line of data to be converted such that with each cycle of the data circulating register, the dictionary is "precessed" (shifted) one character position in the line of data. When a correlation is found, the related



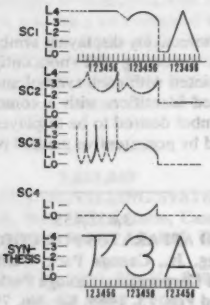
code group of the other format is substituted from the dictionary into the data register. Thus, one line of data is converted in a number of cycles of the data register equal to or less than the number of different character code groups of either format in the dictionary register.

3,631,456

DISPLAY DEVICE FOR DISPLAYING SIMULTANEOUSLY A PLURALITY OF SYMBOLS ARRANGED IN JUXTAPOSED RELATION IN ONE LINE

Terumichi Yokoyama, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed July 15, 1969, Ser. No. 841,795
Claims priority, application Japan, July 15, 1968, 43/49041
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A **7 Claims**



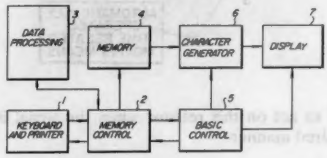
Display device for displaying simultaneously a plurality of alpha-numeric and other special symbols arranged in juxtaposed relation in one line wherein said symbols are displayed by a plurality of horizontal scanning lines which are vertically deflected by a few fundamental waveforms and the phosphor screen of a CRT is excited to luminesence at a required portion or portions of said deflected waveform.

3,631,457

DISPLAY APPARATUS

Nagaharu Hamada, Hitachi-shi; Motosi Miyanaka, Kumagegun, Yamaguchi-ken; Yasuo Suzuki; Isao Yasuda, and Yukitaka Hayashi, all of Hitachi-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 8, 1969, Ser. No. 855,804
Claims priority, application Japan, Sept. 9, 1968, 43/64261
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A **5 Claims**



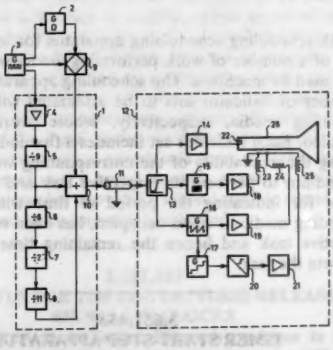
A display apparatus having a keyboard for encoding elements for the display of various characters, symbols or graphs by the combination of dots on a cathode ray tube operated in accordance with the standard television system, and MOS (Metal Oxide Semiconductor) dynamic shift registers for storing the codes representing the characters, symbols on graphs to be displayed. A video signal according to the codes applies intensity modulation to the scanning lines or rasters thereby to effect the desired display on the cathode ray tube. Renewal of displayed character can be effected by displaying a cursor at a renewed position on the cathode ray tube and manipulating the keyboard.

3,631,458

SYSTEM FOR TRANSMITTING AND DISPLAYING CHARACTER INFORMATION

Jean Caron; Claude Mothiron, and Andre Souvay, all of Evreux, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,348
Claims priority, application France, Dec. 27, 1968, 181401
Int. Cl. G08b 5/22
U.S. Cl. 340—324 A **8 Claims**



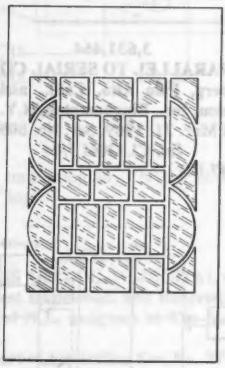
Transmission and display system in which character and synchronization information are converted in a control device, with the aid of modulated clock pulses and two synchronizing signals derived from the clock pulses by frequency division, into one sequential complex signal. The complex signal to be displayed on a television tube in a signal receiver includes three signals of substantially constant amplitude lying at different levels, a first synchronizing signal obtained by division corresponding to the spaces between the

columns of the characters displayed in a matrix, whereas the second synchronizing signal is the line synchronizing signal. A third synchronizing signal is generated in the receiver as a step signal derived from the received line synchronization signal.

3,631,459
INTEGRATED HEATER ELEMENT ARRAY AND DRIVE MATRIX

Marvin L. Morris, Jr., Dallas; Hermon L. Pope, Jr., Houston, and Edward M. Ruggiero, Dallas, all of Tex., assignors to Texas-Instruments Incorporated, Dallas, Tex.

Filed Aug. 8, 1969, Ser. No. 848,564
Int. Cl. G08b *5/36*
U.S. Cl. 340—336 **5 Claims**



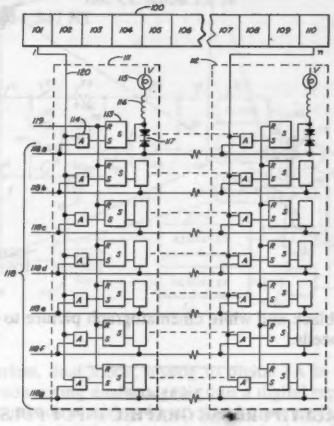
Thermal display including an air-isolated integrated semiconductor circuit forming an array of semiconductor heater elements having different heights, widths and shapes joined by a metallic connecting pattern which extends out over the heating elements to interconnect selected ones of them and a PN-junction isolated integrated semiconductor drive matrix for the heating element array positioned in the same plane as the heating element array. The PN-junction isolated integrated semiconductor drive matrix and the semiconductor heating element array are concurrently formed in the same semiconductor substrate and the heating element array is air isolated to provide a high degree of electrical and thermal isolation for the heating element array while both are located in the same plane on a larger support. The thermally sensitive material on which a dynamic display is formed or on which a permanent display is printed is in direct contact with the monocrystalline semiconductor material of the heating element array and can be passed over the heating element array and the drive matrix.

3,631,460
DISPLAY APPARATUS

John A. Haase, Bloomington, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jan. 7, 1970, Ser. No. 1,080
Int. Cl. G09b *13/00*
U.S. Cl. 340—339 **7 Claims**

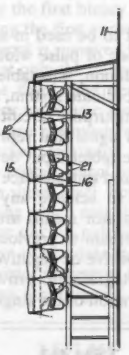
Display apparatus providing a visual indication of the status of bistable devices. The display apparatus also coupling the voltage generated in an inductor, as its field collapses, to utilization means whenever the breakdown voltage of devices exhibiting high-impedance characteristics prior to breakdown and low impedance thereafter is exceeded. The devices being used in connection with a ring which takes advantage of the fold-back characteristic of a commercially available voltage regulator to control pulse advance.



3,631,461
ILLUMINATED DISPLAYS

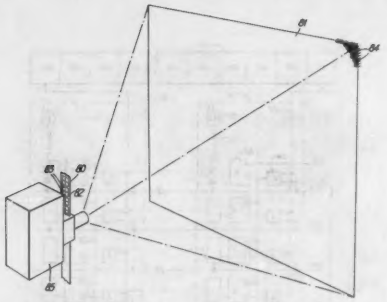
Anthony Powell, Bideford, and Peter Dunstan Renwick Adams, Ware, both of England, assignors to Seemark Switches Limited, Bideford, Devon and Adams Huntley Associates, Ware, England

Filed Nov. 12, 1968, Ser. No. 775,044
Int. Cl. G09f *9/32*
U.S. Cl. 340—339 **6 Claims**



An animated illuminated colored advertising display including a display board built up of individual lighting units each comprising a group of lamps, giving primary colors, behind a translucent screen, and control equipment in the form of a matrix of photoelectric cells equivalent in numbers and positions to the lamps in the display boards and each con-

trolling the switching of a respective lamp, together with a cinematograph projector for projecting on to the photocell



matrix a black and white cinematograph picture to influence the photocells.

3,631,462

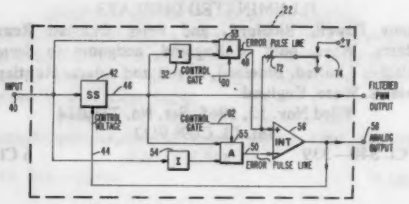
MULTIPURPOSE GRAPHIC INPUT PULSE TRANSDUCING CIRCUIT

Herbert Dym, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,323

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 CC **6 Claims**



A multipurpose circuit to be used in a graphic data tablet for providing the functions of pulse width modulation filtering, pulse width demodulation, selectable bandwidth for sensitivity, translation of coordinate system, and peak track-and-hold capability. The multipurpose circuit receives as its input a pulse width modulated signal that represents positional information from a graphic tablet input device. A voltage-controlled single shot is utilized to transduce the input signal into a desired wave pattern to achieve any of the above-mentioned functions. Comparator means are provided for comparing the input signal stream to previously processed pulses and generate either a positive or negative error signal. These error signals are then integrated to provide a feedback voltage that controls the duration of the single shot.

3,631,463

SELF-CLOCKED ENCODING SCHEME

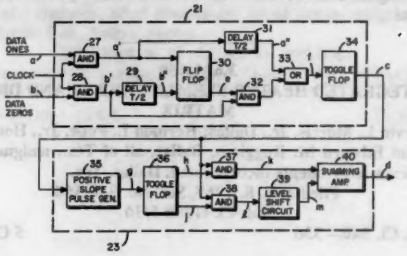
John V. Murphy, Norristown, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 10, 1969, Ser. No. 805,426

Int. Cl. H04l *3/00*; H03k *13/24*

U.S. Cl. 340—347 DD **1 Claim**

A binary data translation system is provided wherein the binary data is first fed into a data encoder to produce a unipolar pulse train characteristic of the data to be transmitted and then a converter is used to convert the unipolar pulse train into a three-level bipolar pulse train, thereby to reduce the bandwidth requirements of the system. The encoder and converter operate to provide a self-clocking data translation system.



3,631,464

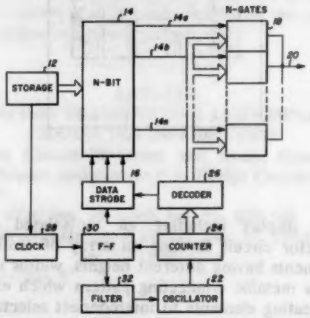
DIGITAL PARALLEL TO SERIAL CONVERTER

Roger C. Dahlberg, Palo Alto, Calif., assignor to Singer-General Precision, Inc., Binghampton, N.Y.

Filed Mar. 21, 1969, Ser. No. 809,355

Int. Cl. G06f *5/04*

U.S. Cl. 340—347 DD **5 Claims**



The disclosed embodiment of the present invention is a digital parallel to serial converter for a television raster display which employs a phase-locked loop for controlling the conversion rate. The disclosed converter is formed of a register which receives data in parallel form, a plurality of transfer gates for transferring data out of the register, and a frequency controlled gating circuit for enabling the transfer gates. The frequency controlled gating circuit is formed of a voltage controlled oscillator having an output connected to a counter, which is, in turn, connected to a decoder from which the gating pulses are derived for enabling the transfer gates. A flip-flop is connected to the counter and to a clock, such that the DC average value of an output thereof forms a feedback control for the oscillator.

3,631,465

FET BINARY TO ONE OUT OF N DECODER

Richard H. Heeren, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

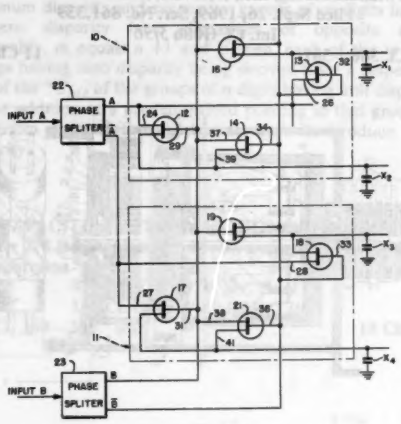
Filed May 7, 1969, Ser. No. 822,533

Int. Cl. H03k *13/25*

U.S. Cl. 340—347 DD **9 Claims**

A circuit is described in which eight field effect transistors are interconnected to translate a two-bit binary word into

one-out-of-four logic. The description further inciudes an explanation of how to apply the principles taught herein to



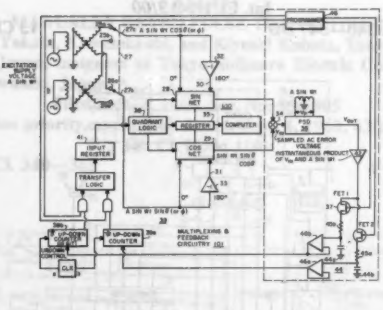
build circuits for translating any "N"-bit binary coded word into one out of 2^N logic.

3,631,466

LOW STALENESS ANALOG-TO-DIGITAL CONVERTER

Marvin Masel, West Englewood, and Robert D. Gross, North Caldwell, both of N.J., assignors to The Singer Company, New York, N.Y.

Continuation-in-part of application Ser. No. 770,166, Oct. 22, 1968. This application Aug. 8, 1969, Ser. No. 848,476
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD 3 Claims



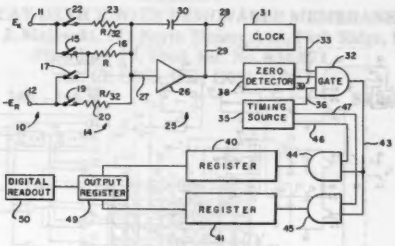
Using a digital-to-synchro converter having a sine and cosine side, synchro sine values are fed to the cosine side and synchro cosine values are fed to the sine side of the converter which in effect multiplies the present sine/cosine value by the previous cosine/sine value. The multiplied outputs are compared and any difference serves as the error signal which is fed back to the converter control register to update the register. The various input channels to the converter are multiplexed, fed through the converter onto a hold capacitor. The information temporarily stored on the capacitors is further processed and sequentially used as the input to the control register of the converter means.

3,631,467

LADDERLESS, DUAL MODE ENCODER

Mario M. Vojvodich, Montclair, and Herbert B. Gillis, Matawan, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 7, 1970, Ser. No. 35,381
Int. Cl. H03k *13/16*
U.S. Cl. 340—347 NT 3 Claims



A ladderless, dual mode, analog to digital (A to D) converter for converting analog signals into a digital representation. The unknown analog input signals are applied for a fixed time period to an integrating circuit through a first input resistor causing the integrator output to reach a first signal level. A reference signal is thereafter applied to the input of the integrating circuit through the first input resistor or through an input resistor having the same value as the first input resistor, thus causing the output signal from the integrating circuit to approach a reference level. During the time that the reference signal is applied to the integrator, pulses from a clock source are stored in a first register. When the output of the integrator reaches the reference potential, the pulses supplied to the register are inhibited. Thus, data stored in the first register represent a first binary approximation of the magnitude of the unknown analog input signal. During a second conversion of the unknown signal, both the unknown analog signals and the reference signals are respectively applied to the input of the integrating circuit through input resistors each of which has a value substantially less than the value of input resistors used during the first conversion cycle. Both the unknown signals and the reference signals are provided to the input of the integrating circuit for a time determined by the first binary approximation stored in the first register during the first conversion cycle. Thereafter, only the reference signal is removed from the input to the integrator circuit so that only the unknown signal is applied for the remainder of the fixed time period causing the output signal of the integrator to assume a second level. Thereafter, the unknown signals are removed from the input of the integrator and the known reference signal is again applied thereto to cause the output signal level of the integrator to approach a reference signal level. For the time of the second conversion cycle during which only the reference signal is applied to the integrator circuit, pulses are fed to a second register. The binary sum of the data stored in the first register and in the second register represents the total binary approximation to the unknown input signal.

3,631,468

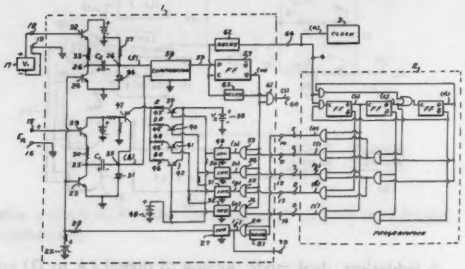
ANALOG TO DIGITAL CONVERTER

William L. Spaid, R.R. No. 1 South River Road, Cedarville, Ohio

Filed July 2, 1970, Ser. No. 51,791
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD 3 Claims

An analog to binary number converter, for operation in synchronism with the clock of a computer, in which the analog input signal charges a first capacitor to the analog voltage. A second capacitor, initially charged to a voltage

equal on the analog scale to the value of the most significant bit of the binary number, is subsequently discharged as an exponential function of time such that the capacitor voltage at the end of each of a succession of equal bit intervals, which are the clock pulse intervals, has one-half its value at the start of the interval. At the start of each of the successive bit intervals the voltage of the first capacitor is compared with the voltage of the second capacitor. If greater, the first capacitor is permitted to discharge during the interval suffi-



ciently to reduce its voltage by the amount of the second capacitor voltage at the start of the interval. If less, the first capacitor voltage is held constant during the interval. At each comparison, a binary 1 is generated if the first capacitor voltage is greater than the second capacitor voltage and a binary O if less, thus generating a serial binary number. By using a plurality of such converters and overlapping their conversion cycles, parallel binary codes are generated at an analog sampling rate equal to or a multiple of the clock rate.

3,631,469

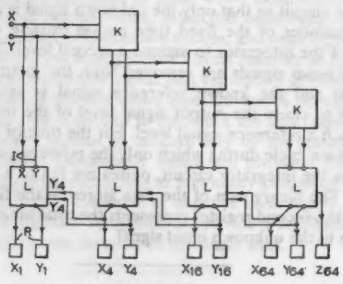
SYSTEMS FOR COMPARING ELECTRICAL SIGNALS

Ralph Levy, Leeds, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of application Ser. No. 487,765, Sept. 16, 1965, now abandoned. This application Aug. 28, 1969, Ser. No. 853,002

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 AD **4 Claims**



The present invention features a system for comparing the amplitudes and signs of two simultaneous electrical signals. A chain of discriminators is arranged to determine with successively greater resolution the angle $P = \tan -1\ X/Y$) where X and Y respectively have the signs and amplitudes of each of the said two signals. In each discriminator except the first in the chain means are provided for inhibiting or correcting errors in the immediately preceding discriminator.

3,631,470

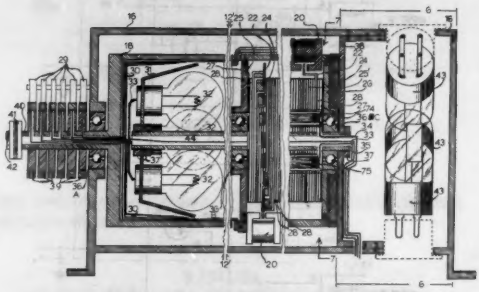
AUDIO CONSOLE DELEGATION SYSTEM WITH VISUAL READOUT

Robert A. Bloom, Oak Park, Mich., assignor to Audio Designs and Manufacturing, Inc., Roseville, Mich.

Filed Sept. 26, 1969, Ser. No. 861,339

Int. Cl. G08b *5/36*

U.S. Cl. 340—381 **11 Claims**



An audio console delegation system distributor switching unit. Reed relays for selectively enabling a program source to a plurality of program busses and readout means for visually indicating which busses are enabled. Independent electrical lighting elements, each in a separate light well, direct light through a numerical indicia created by an open area in a black nonlight transmitting layer, then through a layer of white translucent material and finally through a panel of transparent smoke gray or red material to produce a sharp projection of the indicia on a mat exterior surface of the panel.

3,631,471

LOW DISPARITY BINARY CODES

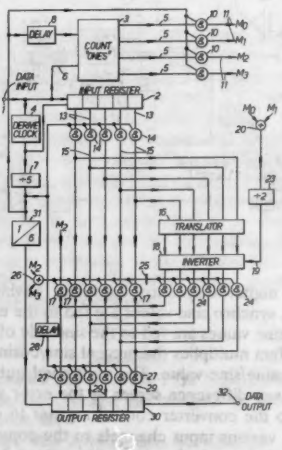
John Michael Griffiths, Hillingdon, England, assignor to The Post Office, London, England

Filed Dec. 8, 1969, Ser. No. 882,938

Claims priority, application Great Britain, Dec. 13, 1968, 59,503/68

Int. Cl. H04l *3/00*

U.S. Cl. 340—347 DD **13 Claims**



A method and apparatus for recoding a sequence of binary digits into a form having lower disparity for transmission and the transformation of the data back into its original form are

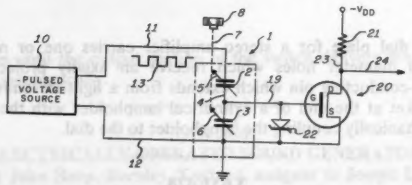
described. In recoding, successive groups of n binary digits are recoded as groups of m binary digits, where m is greater than n, and both are positive integers. Recoding is arranged so that some but not all of the groups of m digits have minimum disparity and successive groups of m digits having nonzero disparity have disparities of opposite signs. Preferably, m equals $n+1$ and is even, each of the m digit groups having zero disparity being derived from a respective one of the ${}^{m}C_{m/2}$ of the groups of n digits having unit disparity by the addition at a predetermined position in that group of one extra digit of the appropriate type to produce zero disparity.

3,631,472

CAPACITIVE KEYING MODULE AND SYSTEM

Andrew J. Lincoln, Concord, Mass., assignor to Sperry Rand Corporation

Filed Jan. 2, 1970, Ser. No. 125
Int. Cl. G08c 1/00; H03k 17/80
U.S. Cl. 340—365 **15 Claims**



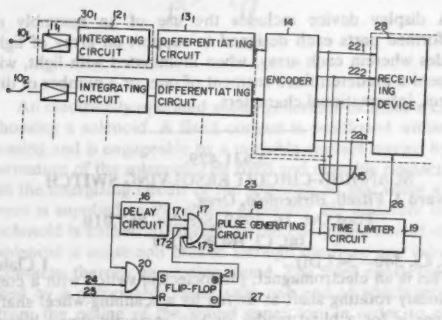
A modular key for an electrical keyboard employs a capacitive voltage divider circuit with stator and armature capacitive elements forming a pair of capacitors in ganged relation. Downward motion of one capacitor element when a key is manually depressed produces a corresponding change in the output of the divider sufficient to overcome the threshold of a transistor detector circuit. An inverted output data pulse is supplied, free of disturbing transients, at the input of associated digital processing equipment.

3,631,473

MANUALLY KEYED PULSE TRANSMITTER

Akio Yakata, Kawasaki-shi, and Kiyoshi Kubota, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sept. 2, 1969, Ser. No. 854,805
Claims priority, application Japan, Sept. 4, 1968, 43/62990
Int. Cl. H04q 1/30
U.S. Cl. 340—365 **4 Claims**



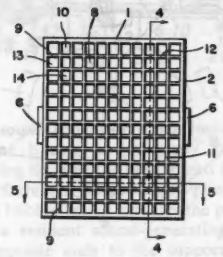
A signalling device with a plurality of signal generating switches, a plurality of pulse generating circuits corresponding to the respective switches, are provided, as well as an encoder for encoding outputs from the pulse generating circuits to supply encoded signals to a receiving device. The signalling device applies the signal from one of the signal generating switches to the receiving device while one or more other switches are maintained in their operative condition.

3,631,474

DISPLAY DEVICE WITH REMOVABLE MEMBRANES

Eugene J. Majewski, 121 North Elmore Ave., Park Ridge, Ill.

Filed June 17, 1969, Ser. No. 834,071
Int. Cl. G08b 5/00; G09f 13/06
U.S. Cl. 340—366 R **8 Claims**



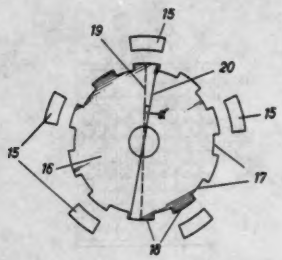
In this specification, the gist of the technical disclosure resides in a thin-wall, light message-transmitting element which can be masked, peeled, cut, punched or molded in selected patterns and placed over a glass or plastic reflector, or over a glass or plastic lens, or over a translucent or light-diffusing element to convey a message from a light reflector or a backlighted device. The element is constructed of a piece of opaque material or light-transmitting or filtering material, such as thin-wall acrylic, styrene, butyrate, polycarbonate or other type of material having the properties of light blockage, transmission or filtering. The element is constructed in such a way as to include preformed designations of outlines such as squares, rectangles, triangles, diamonds, circles and the like which a user may mask, peel, cut or punch in selected sequences to form symbols such as an arrow, numerals such as house numbers, and letters to form words such as "Caution," "Stop," "Slow," a person's name or initials, and the like. Such a light message-transmitting element is constructed with tabs or other fastening devices corresponding with receiving inserts on the glass or plastic reflector, lens or translucent or diffusing light element, for attachment and detachment for the purpose of readily detaching the light message-transmitting element to perforate the marked portions in whatever selected sequence desired to form the indication or message desired to convey upon light being either reflected from the front or transmitted from behind, depending on whether used with a reflecting element, a lens, or translucent or light-diffusing element being backlighted.

There are obviously many other ways in which the element can be attached and detached to the light reflector or backlighted device, such as adhesives, heat-sealing, solvents, sonic welding and the like. Once the desired indication or message has been made on the element by masking, peeling, cutting or punching the selected marked portions, the element is then placed by whatever attachment means selected over the reflecting element, lens or translucent or light-diffusing element, to form either a reflective device or backlighted device having a directive sign or message.

It is also possible to make the message-transmitting element a permanently assembled part of the reflector or backlighted device by solvent cementing or sonic welding to the faces thereof. The membranes would be punched out in

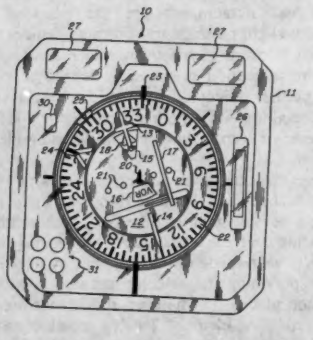
place without removing the element from the reflector or backlighted device.

3,631,475
ELECTROMECHANICAL INDICATOR DEVICE
Gerhard Quandt, Heidelberg, and Hans-Christian Muller, Waldhilsbach, both of Germany, assignors to Feldix G.m.b.H., Heidelberg, Germany
Filed Dec. 5, 1969, Ser. No. 882,596
Claims priority, application Germany, May 24, 1969, P 19 26 734.6 May 24, 1969, Germany, P 19 26 733.5
Int. Cl. G08b 5/24; H02k 21/16
U.S. Cl. 340—366 10 Claims



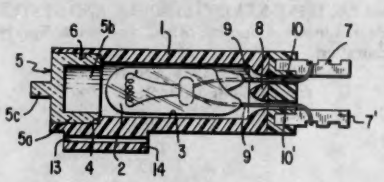
An electromechanical rotary indicating device for selectively displaying a plurality of symbols having a cylindrical permanent magnet rotor, to which a symbol-carrying member is coupled, which is selectively deflectable to a plurality of discrete angularly spaced positions by selective energization of the excitation coils or windings placed on the pole pieces of the stator. The periphery or surface of the rotor is provided with a plurality of longitudinal or axial grooves which are arranged asymmetrically with respect to the direction of the magnetic field in the rotor, which direction is transverse to the axis of rotation of the rotor.

3,631,476
MULTIPLE ANNUNCIATOR FOR AIRCRAFT INSTRUMENTS
Richard E. Schaffer, Scottsdale, Ariz., assignor to Sperry Rand Corporation
Filed Nov. 10, 1969, Ser. No. 875,009
Int. Cl. G08b 5/00
U.S. Cl. 340—378 11 Claims



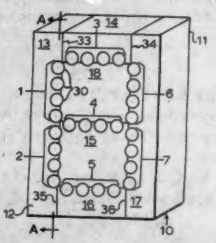
A display device for multiple annunciation instruments, particularly of the type used in aircraft, comprising a mask having two diametrically arranged apertures therein. A disk, having a plurality of display indicia disposed on its surface, is mounted for rotation behind the mask so that selected display indicia may be positioned adjacent the apertures to be viewable therethrough. One of the display indicia may include a VOR arrowhead symbol which may be selectively positioned adjacent either of the two apertures.

3,631,477
PILOT LAMPHOLDER AND DIAL ASSEMBLY
Ryoya Matsushima, Tokyo, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan
Filed Sept. 11, 1969, Ser. No. 857,082
Int. Cl. G08b 5/36
U.S. Cl. 340—381 7 Claims



A dial plate for a stereo amplifier carries one or more small diameter holes which receive an axially projecting light-conducting pin which extends from a light-transmitting bracket at the end of a cylindrical lampholder with the pin mechanically coupling the lampholder to the dial.

3,631,478
LIGHT GUIDE SUPPORT MEANS AND DISPLAY DEVICE UTILIZING SAME
Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif.
Filed Sept. 23, 1970, Ser. No. 74,624
Int. Cl. G08b 5/36
U.S. Cl. 340—380 5 Claims

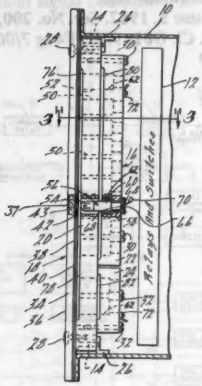


A display device includes the use of an assembly of preformed parts each designed to support an array of light guides wherein each array, when illuminated with light, will present a predetermined segment of one, or a number of different, informational characters.

3,631,479
SCANNING-CIRCUIT RESOLVING SWITCH
Edward J. Fitzell, Birkenfeld, Oreg.
Filed Oct. 16, 1969, Ser. No. 867,010
Int. Cl. H03h 13/24
U.S. Cl. 340—347 DD 1 Claim

This is an electromagnet, photoelectric switch with a continuously rotating shaft as driven by a scanning-wheel shaft. Its use is for a blind reader or any correctly timed binary code groups. There are several hundred binary code light holes possible on a relatively small code disk as for each disk to represent a cell of the scanning system array of cells. The

disks automatically reset on null operations. On a valid code, a light beam gets through and a fast-acting relay system holds



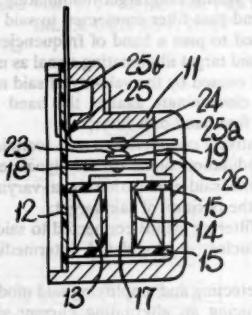
them until the output section of the switch delivers the output mechanically.

3,631,480

ELECTRICALLY OPERATED SOUND GENERATORS

Alec John Heap, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 2, 1970, Ser. No. 7,799
Claims priority, application Great Britain, Feb. 11, 1969, 7270/69
Int. Cl. G08b 3/10
U.S. Cl. 340—388 **2 Claims**



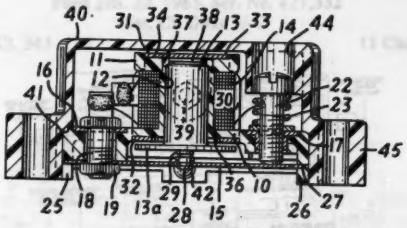
An electrically operated sound generator includes a casing housing a solenoid. A fixed contact is positioned within the casing and is engageable by a movable contact carried by the armature of the solenoid. The fixed and movable contacts are in the energizing circuit of the solenoid, so that when a current is supplied to the sound generator the armature of the solenoid is caused to vibrate, as the energizing circuit of the solenoid is made and broken through the fixed and movable contacts, thereby generating sound. The fixed contact is carried by a deformable metal strip one end of which projects from the casing of the sound generator. In order to effect tuning of the sound generator the projecting end of the strip is moved to deform the strip to alter the position of the fixed contacts relative to the solenoid.

3,631,481

SOUND GENERATOR

Rein Haus, Long Branch, N.J., assignor to Wheelock Signals, Inc., Long Branch, N.J.

Filed Nov. 26, 1969, Ser. No. 880,135
Int. Cl. G08b 3/00
U.S. Cl. 340—388 **11 Claims**



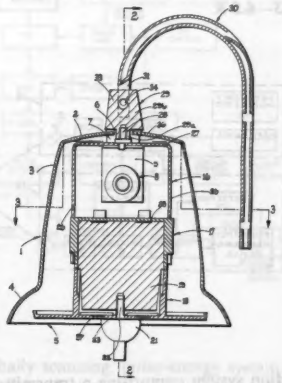
A compact sound generator which includes an insulating supporting base having an integrally formed bobbin, a passage extending through the bobbin and the support for accommodating therein a reciprocating plunger, an electrical winding on the bobbin which actuates the plunger upon energization, and a resilient sound-generating diaphragm strip mounted at opposite ends to the support with the unsupported intermediate span engageable by the plunger to generate the sound.

3,631,482

ELECTRICALLY OPERATED BELL WITH INTERNAL POWER SOURCE

Edward Leslie Merritt, Birmingham, England, assignor to Evered and Company Limited, Smethwick, Warley, England

Filed July 18, 1969, Ser. No. 843,151
Claims priority, application Great Britain, July 20, 1968, 34725/68
Int. Cl. G08b 3/00; G10k 1/064
U.S. Cl. 340—396 **7 Claims**

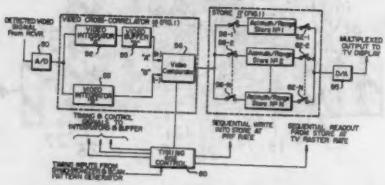


An electrically operated bell is provided with a bell-shaped resonant body and means for suspending the bell with its open end presented downwardly. A striker, a motor unit and means for supplying current to the motor unit are supported within the resonant body so that only the latter and the simulated clapper are normally visible.

3,631,483
SHORT PERSISTENCE RADAR DISPLAY SYSTEM

Norman A. Ruggles, Pasadena, and Irving I. Kaplan, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1970, Ser. No. 12,207
Int. Cl. G01s 7/04
U.S. Cl. 343—5 SC 11 Claims

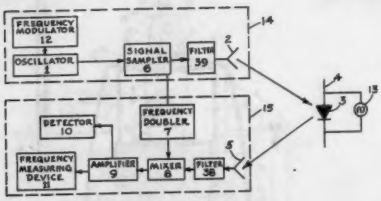


A low PRF radar system display utilizes a cathode-ray tube having a short persistence time in a television type display. The video signal detected from the radar return signal in the receiver is sampled and converted to digital form, and the digital numbers are integrated over each beamwidth of the antenna pattern during an azimuth scan. The digital results of the integration for each beamwidth are stored in separate stores and are read out nondestructively, so that they may be updated during successive azimuth scans, at the raster rate of the TV display. The sequentially readout contents of the stores are converted to analog format and supplied to appropriate control elements of the cathode-ray tube. The operation to provide a processed video output to the display constitutes video cross-correlation and storage and permits use of the television type display.

3,631,484
HARMONIC DETECTION SYSTEM

Harry A. Augenblick, Mountain Lakes, N.J., assignor to Microlab/FXR, Livingston, N.J.

Filed July 30, 1969, Ser. No. 845,955
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 R 9 Claims

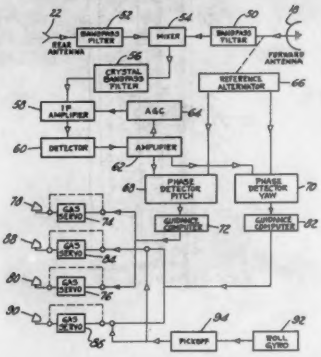


A detection system comprising a transmitter for radiating signal of frequency "F" to a harmonic generator. The generator is adapted to produce a signal of frequency "XF+XD" where XF is a harmonic of the transmitted signal and XD is a frequency shift due to the movement of the generator. A receiver includes a multiplier connected to the transmitter for producing a signal XF and a mixer adapted to receive the harmonic generator signal and the multiplier signal for producing a signal proportional to the difference therebetween.

3,631,485
GUIDANCE SYSTEM

Harry L. Beazell, Jr., South Bend, Ind., assignor to Bendix Corporation, Mishawaka, Ind.

Filed June 5, 1962, Ser. No. 200,224
Int. Cl. G01s 9/02; F41g 7/00
U.S. Cl. 343—7 ED 4 Claims



2. In a guidance system for a missile, said system including an illuminating radar and its antenna and said missile including pitch and yaw control devices, a rear antenna and a front scanning antenna;

said illuminating radar including means for generating a high-frequency reference signal, means for generating a second signal of lower frequency, a mixer for combining said second and said reference signals to produce a target-illuminating signal, means for receiving and amplifying both of said reference and illuminating signals and for connecting said amplified signals to said illuminating antenna;

said missile including a first band-pass filter connected to said rear antenna adapted to pass a band of frequencies including the frequency of said reference signal as modified by the Doppler effect caused by the velocity of said missile and to discriminate against said target-illuminating signal;

a second band-pass filter connected to said front scanning antenna adapted to pass a band of frequencies including the frequency of said target illuminating signal as modified by the Doppler effect caused by the velocity of said missile and said target and to discriminate against the band of frequencies passed by said first band-pass filter;

means operatively connected to said scanning antenna for imposing a modulation signal on the signal received by said scanning antenna, said modulation signal varying in phase depending upon the position of said target;

mixing and filtering means connected to said band-pass filters for producing a modulated intermediate frequency signal;

means for detecting and amplifying said modulated signal;

means producing an alternating current signal in phase with the movement of said scanning antenna;

and phase-responsive means for comparing said modulated signal with said alternating current signal for controlling the operation of said pitch and yaw control devices.

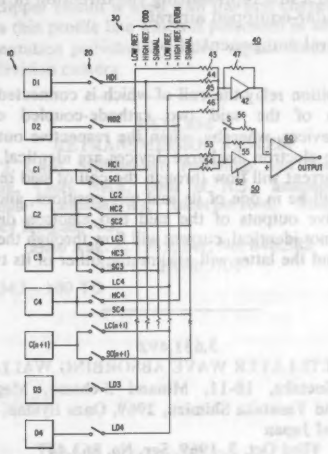
3,631,486
PROCESSING METHOD AND COMMUTATION SYSTEM FOR PULSE DOPPLER RADAR

Roland A. Anders; David E. Callahan, both of Baltimore; F. Stewart Myers, Jr., Severna Park, and James M. Saboe, Ellicott City, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1969, Ser. No. 835,995
Int. Cl. G01s 9/44
U.S. Cl. 343—8 17 Claims

In a pulse Doppler radar system, a threshold level for target detection is automatically adjusted as a function of

clutter and noise. A commutation network for interrogating each of a plurality of Doppler channels simultaneously interrogates channels of adjacent higher and lower frequencies for deriving a threshold signal comprising an average or normal-

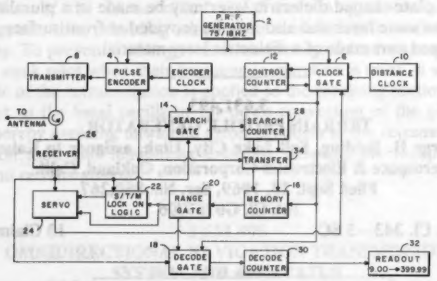


ized detection threshold for the interrogated channel, for all channels. The commutation system also provides for enhancement of the accuracy of velocity measurement of a given number of Doppler channels by interpolating between consecutive pairs of channels.

3,631,487
COMPLEMENTARY SEARCH SYSTEM FOR D.M.E.

Dean P. Huntsinger, Marion, and Floyd M. Totten, Cedar Rapids, both of Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed Mar. 9, 1970, Ser. No. 17,674
Int. Cl. G01s *9/14, 9/16*
U.S. Cl. 343—7.3 **6 Claims**

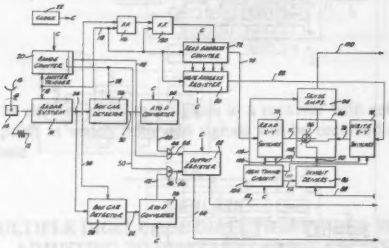


An all-digital, distance measuring radio equipment is disclosed wherein the duration of each cycle of operation is determined by a train of clock pulses which is applied to a plurality of counters. Detection of a reply signal triggers a search counter which then counts until the end of the cycle. At the end of the cycle the count acquired by the search counter is transferred into a memory counter which starts the subsequent cycle at this value, establishes a range gate upon reaching a count corresponding to the maximum range, starts counting again from zero and ends the cycle at the same count that it held at the start of the cycle. A decode counter counts from the start of each cycle to the center of the range gate and, upon receipt of the range gate center signal, applies its acquired value to a readout means to indicate distance.

3,631,488
DIGITAL MOVING TARGET INDICATOR CANCELLATION SYSTEM

Norol T. Evans, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 22, 1965, Ser. No. 427,332
Int. Cl. G01s *9/42*
U.S. Cl. 343—7.7 **11 Claims**

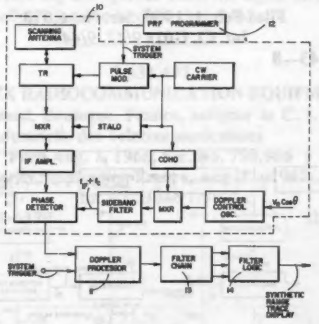


This invention relates to moving target indicator systems for determining the presence of moving targets with a radar system and particularly to an improved and highly reliable digital moving target indicator cancellation system.

3,631,489
MTI SYSTEM HAVING IMPROVED DISCRIMINATION OF TARGETS DISPLAYING AMBIGUOUS DOPPLER SHIFTS

George P. Cooper, Corona Del Mar, Calif., assignor to North American Rockwell Corporation

Filed Oct. 2, 1969, Ser. No. 863,192
Int. Cl. G01s *9/42*
U.S. Cl. 343—7.7 **10 Claims**



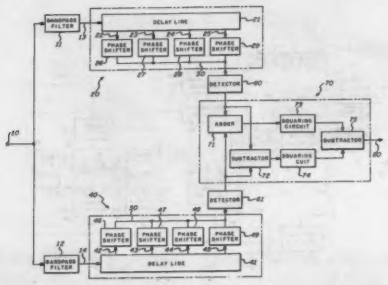
An azimuthally scanning, pulse-energy system employing doppler processing of clutter-referenced received echoes of pulsed transmission, including means for improved discrimination between high-speed moving targets displaying ambiguous doppler shifts and targets of lesser velocity. The pulse repetition rate of the pulsed energy system is periodically alternated between two rates, and the received signals associated with each pulse repetition rate separately doppler processed. Variations in the apparent doppler shift of a target in response to variation in the system pulse repetition rate is deemed indicative of a target of interest.

3,631,490

SIGNAL PROCESSOR FOR REDUCING CLUTTER AND ELIMINATING RANGE AMBIGUITIES IN TARGET DETECTION SYSTEMS

Chester A. Palmieri, New Hyde Park, N.Y., assignor to Sperry Rand Corporation

Filed Mar. 17, 1969, Ser. No. 807,689
Int. Cl. G01s *7/28, 9/42*
U.S. Cl. 343—7.7 **15 Claims**



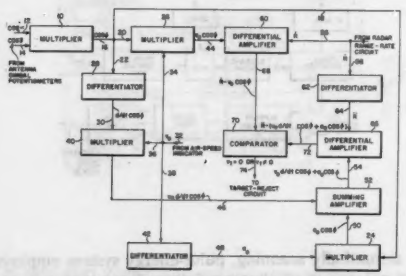
Apparatus for processing target detection system signals consisting of two pulse sequences of different pulse repetition frequencies reflected from a radially moving target and noise or clutter signals reflected from a relatively stationary background. The apparatus comprises two matched filters responsive to the signals having frequency responses matched respectively to the frequency spectra of the two pulse sequences. A multiplier provides an output signal representative of the product of the signals from the two matched filters.

3,631,491

TARGET VELOCITY DISCRIMINATOR

William W. Cuthbert, Oxnard, Calif., assignor to The United Sates of America as represented by the Secretary of the Navy

Filed Feb. 1, 1960, Ser. No. 6,070
Int. Cl. G01s *9/42, 9/44*
U.S. Cl. 343—8 **4 Claims**



4. In an airborne radar apparatus designed to track a target and to yield range information with respect thereto, a differential amplifier including two cathode-coupled electron discharge devices to the respective control electrodes of which are applied a range-rate voltage from the said radar apparatus and an electrical quantity representative of

$$V_0 \cos \alpha \cos \theta$$

where

V_0=the airspeed of the craft carrying the radar

α=the vertical component of ϕ, the angle formed by a line representing the direction of the target from the radar and a line representing the direction of heading of the radar-equipped aircraft

θ=the lateral component of ϕ,

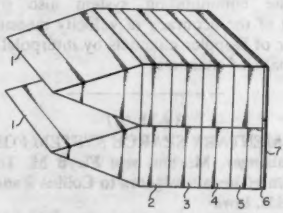
a two-position relay the coil of which is connected across the anodes of the said two cathode-coupled electron discharge devices, whereby, when the respective outputs of the said two electron discharge devices are identical, no appreciable current will flow through the coil of said relay and the latter will be in one of its said tow positions, and, when the respective outputs of the said two electron discharge devices are not identical, current will flow through the coil of said relay and the latter will assume the other of its two said positions.

3,631,492

MULTI-LAYER WAVE ABSORBING WALL

Kunihiro Suetake, 10-11, Minami 3-chome, Meguro-ku, Tokyo, and Yasutaka Shimizu, 2969, Oaza Iiyama, Iiyama-shi, both of Japan

Filed Oct. 3, 1969, Ser. No. 863,447
Claims priority, application Japan, Oct. 9, 1968, 43/73677
Int. Cl. H01q *17/00*
U.S. Cl. 343—18 A **3 Claims**



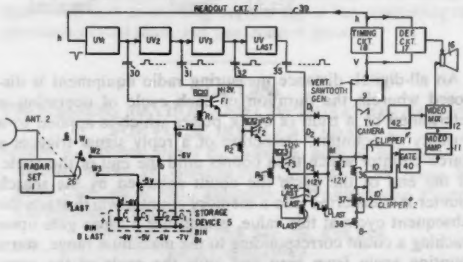
A superwide band wave absorbing wall of a thin multilayer type, which comprising a plate-shaped dielectric layer, a plate-shaped magnetic material lossy material, and a metal plate backing said magnetic material lossy material plate. The plate-shaped dielectric layer may be made in a plurality of the same layer and also may be provided at front surface a tapered part made of a dielectric lossy material.

3,631,493

TERRAIN PROFILE GENERATOR

George H. Balding, Salt Lake City, Utah, assignor to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.

Filed Sept. 23, 1969, Ser. No. 860,267
Int. Cl. G01s *7/06*
U.S. Cl. 343—5 SC **13 Claims**



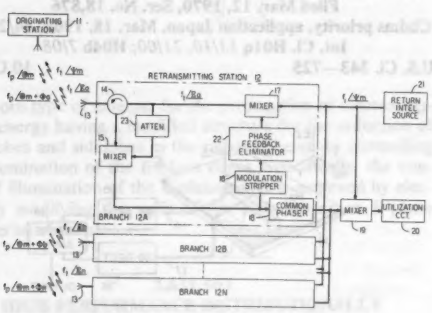
A signal converter for converting terrain representative signals obtained in a radar scan into a display of a profile line

on a cathode-ray tube of the terrain which is scanned. Electronic switches gate the detected radar information to capacitors in a storage matrix, and emitter followers are used in a readout circuit operated at the horizontal scan frequency to selectively gate the stored information over mixing diodes to a first clipper circuit for conversion to video signals. A second clipper circuit is used with the first clipper circuit to provide a thin profile line which is presented as an overlay to the presentation provided by video signals from a conventional television camera.

3,631,494
RETRANSMISSION SYSTEM

Michael J. Gans, Middletown Township, and Douglas O. J. Reudink, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 8, 1969, Ser. No. 848,582
Int. Cl. H04b *7/00*
U.S. Cl. 343—100 TD **12 Claims**



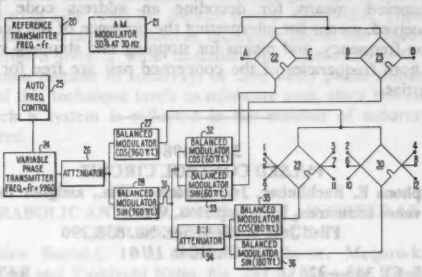
In a space diversity phased array radio station capable of retransmission, each branch receives a pilot signal containing phase information which is used to continuously control the phase of the retransmitted signal containing return intelligence, thus providing adaptive retransmission from the array. To prevent a strong retransmission signal from swamping a weak pilot when their frequency separation is small, a sample of the retransmission is applied to the receiving section to act as the local oscillator for down-conversion of the pilot, thereby avoiding unwanted mixer products in the retransmission loop and minimizing crosstalk between the reception and retransmission.

3,631,495
OMNIDIRECTIONAL NAVIGATION TRANSMISSION SYSTEM AND APPARATUS

Robert Walter Redlich, Jannali, New South Wales, Australia, assignor to The University of Sydney, Sydney, New South Wales, Australia

Filed May 14, 1969, Ser. No. 824,568
Claims priority, application Australia, May 24, 1968, 38279
Int. Cl. G01s *1/38*
U.S. Cl. 343—106 D **10 Claims**

This invention relates to an omnidirectional navigation transmission system for aircraft wherein a "reference" phase signal which is amplitude modulated at a selected frequency is radiated omnidirectionally, and wherein a "variable" phase signal which is frequency modulated by a signal of approximately square waveform is radiated to produce a rotating field in space, said variable phase signal being frequency modulated at said selected frequency and being phase locked with said reference phase signal whereby bearing information

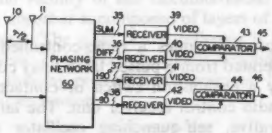

REFERENCE TRANSMITTER FREQ. - fr
A.M. MODULATOR 30% AT 30 HZ
AUTO FREQ. CONTROL
VARIABLE PHASE TRANSMITTER FREQ. = fr + 9960
ATTENUATOR
BALANCED MODULATOR COS(960 Ωt)
BALANCED MODULATOR SIN(960 Ωt)
BALANCED MODULATOR COS(60 Ωt)
BALANCED MODULATOR SIN(60 Ωt)
ATTENUATOR
BALANCED MODULATOR COS(30 Ωt)
BALANCED MODULATOR SIN(30 Ωt)

may be derived from said signals at a receiver with reference to a point at which both said signals will be received exactly in phase.

3,631,496
MULTIPLE DIGIT CODE DIRECTION FINDER SELF-ADJUSTING TO DIFFERENT FREQUENCIES

Charles Fink; Fred E. Burnham, both of Silver Spring, and Maury I. Marks, Bowie, all of Md., assignors to Litton Systems, Inc., Silver Spring, Md.

Filed Oct. 22, 1965, Ser. No. 501,231
Int. Cl. G01s *3/46*
U.S. Cl. 343—113 R **18 Claims**

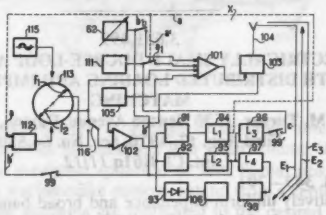


A direction finding system producing a multiple digit code representing the direction of an emitted signal and including means for resolving ambiguities when the signal arrives at an angle normally giving rise to digit changeover.

3,631,497
DUPLEX RADIOCOMMUNICATION EQUIPMENT

Didier Leonard, Boulogne, France, assignor to C. I. T. Compagnie Industrielle des Telecommunications

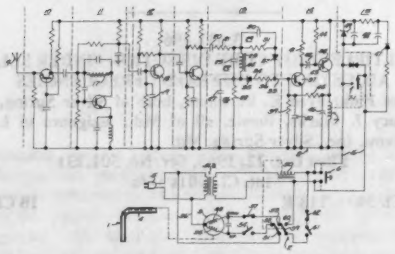
Filed Aug. 7, 1968, Ser. No. 750,986
Claims priority, application France, Aug. 11, 1967, 117,836
Int. Cl. H04b *1/50*
U.S. Cl. 343—179 **17 Claims**



A duplex radiocommunication transceiver with carrier frequencies that are made available to all parties of a network comprises a generator providing a plurality of pairs of

frequencies and which is equipped with a stepping switch, a coder for coding the address of a correspondent, means for transmitting an occupation frequency in a channel which is occupied, means for decoding an address code being received, means for interpreting the presence of the occupation frequency, and means for stopping said stepping switch if both frequencies of the concerned pair are free for both parties.

3,631,498
PULSED CONTROL CIRCUIT
Alphons E. Bachhuber, Jr., Appleton, Wis., assignor to Advance Industries, Inc., Appleton, Wis.
Filed July 1, 1969, Ser. No. 838,290
Int. Cl. H04b *1/16*
U.S. Cl. 343—228 **8 Claims**

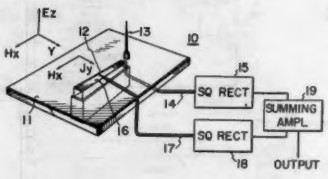


The disclosure includes a radio-controlled garage door operator, operated from a pulsed latch relay connected to be energized by a pushbutton switch or contacts of a pulsed relay of a radio control receiver unit. The latter includes a superregenerative, self-quenching oscillator receiver connected to a channel selection and demodulating circuit. The selection circuit includes a paralleled resistor and capacitor in series with a diode to pass the desired door-operating frequency signal and actuate an electronic switch. A bypass circuit includes a parallel capacitor and adjustable inductor in series with an attenuating circuit including a paralleled resistor and capacitor. The inductor-capacitor resonates at the door-operating frequency. The output circuit includes a pair of complementing normally off transistors interconnected by a timing and disconnect capacitor. The first transistor is driven on and provides a turn on bias path for the second transistor including the capacitor to momentarily actuate the latch relay. The capacitor is maintained charged through an alternate path which when the first transistor turns off provides a rapid discharge capacitor path. The receiver circuit is connected to the power supply through the same contacts connected to actuate the relay and thereby provides a two-wire control connection.

3,631,499
ELECTRICALLY SMALL DOUBLE-LOOP ANTENNA WITH DISTRIBUTED LOADING AND IMPEDANCE MATCHING
Edwin M. Turner, 1530 Newton Avenue, Dayton, Ohio
Filed Aug. 17, 1970, Ser. No. 64,520
Int. Cl. H01q *11/12*
U.S. Cl. 343—701 **8 Claims**

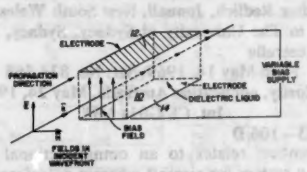
Relatively uniform impedance and broad bandwidth is obtained in a double-loop electrically small antenna by transformer coupling in phase opposition the ends of the loops. For receiving, amplification may be added within the loops to increase the effective electrical output of the antenna. The electrical output of the antenna may be remotely controlled at the receiver, to preclude overloading the receiver, by changing the potential supplied the amplifier over the conventional signal transmission line connecting the receiver to the antenna.

3,631,500
ENERGY DENSITY ANTENNA APPARATUS FOR MOBILE RADIO RECEIVER
Kiyohiko Itoh, Sapporo, Japan, assignor to Hokkaido University, Sapporo, Hokkaido, Japan
Filed Mar. 12, 1970, Ser. No. 18,876
Claims priority, application Japan, Mar. 18, 1969, 44/20057
Int. Cl. H01q *13/10, 21/00;* **H04b** *7/08*
U.S. Cl. 343—725 **10 Claims**



An energy density antenna has a magnetic current antenna in the form of a slot in a conducting plate and an electric current antenna in the form of a unipole normal to the plate with the signals from each antenna independently coupled to separate square law detectors and combined to provide an output signal which is relatively immune to fading due to motion of the antenna through a standing wave pattern.

3,631,501
MICROWAVE PHASE SHIFTER WITH LIQUID DIELECTRIC HAVING METALLIC PARTICLES IN SUSPENSION
Harold T. Buscher, Berkeley, Calif., assignor to General Dynamics Corporation
Filed Feb. 16, 1970, Ser. No. 11,712
Int. Cl. H01q *19/06*
U.S. Cl. 343—754 **31 Claims**



Microwave phase shifters and electronic beam steering antennas are described which use an electrically controllable anisotropy dielectric medium in the microwave beam path.

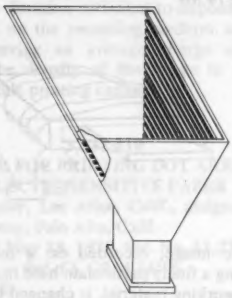
3,631,502
CORRUGATED HORN ANTENNA

Leon Peters, Jr., and Richard E. Lawrie, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation

Filed Oct. 21, 1965, Ser. No. 500,024. The portion of the term of the patent subsequent to July 28, 1987, has been disclaimed.

Int. Cl. H01q *13/00*

U.S. Cl. 343—786 5 Claims



A horn type of antenna for the propagation of electromagnetic energy having a modified structure for the reduction of backlobes and sidelobes in the radiated beam by controlling the illumination of the E-plane edges. Specifically, the control of illumination of the E-plane edges is achieved by electrically modifying the walls of the horn having an E-plane edge as an element.

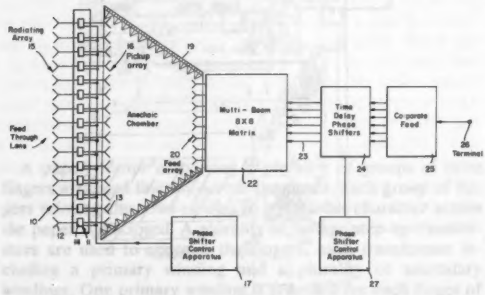
3,631,503
HIGH PERFORMANCE DISTRIBUTIONALLY INTEGRATED SUBARRAY ANTENNA

Raymond Tang, Anaheim, and Nam San Wong, La Habra, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 2, 1969, Ser. No. 821,209

Int. Cl. H01q *3/26*

U.S. Cl. 343—754 10 Claims



The apparatus of the present invention provides a space-fed antenna system with a capability of forming highly efficient, multiple simultaneous beams over a broad instantaneous frequency bandwidth. The space-fed antenna system consists of a feed-through lens with a high-performance feed system. This invention employs the technique of resolving the radiating array of the feed-through lens into subarrays which overlap each other completely over the entire radiating aperture. Each of the subarrays has a truncated $\sin x/x$ amplitude distribution across the entire radiating aperture where x is linear distance therealong, thus producing a radiation pattern closely rectangular in shape. The rectangular subarray pattern is ideal, since it maximizes the array gain and minimizes the grating lobe level for a given system bandwidth. Therefore, this overlapping subarray technique allows the antenna to perform over a wide instantaneous bandwidth with a minimum number of subarrays or time delay phase shifters. Use of this technique tends to minimize cost, since the cost of such a system is reflected in the number of subarrays required

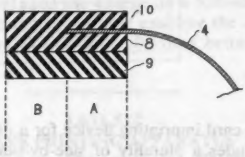
3,631,504
PARABOLIC ANTENNA WITH WAVE ABSORBER AT CIRCUMFERENTIAL EDGE

Kunihiro Suetaki, 10-11 Minami 3 chome, Mequro-ku, Tokyo, and Yoshiyuki Naito, No. 261-44 Suenaga, Kawasaki-shi, both of Japan

Filed Dec. 15, 1969, Ser. No. 884,832

Int. Cl. H01q *19/12*

U.S. Cl. 343—840 5 Claims



An antenna having a parabolic reflector including a wave absorber in the vicinity of the circumferential edge of the reflector. The absorber is composed of layers of different absorbing materials. The edge of the reflector is inserted into one of the layers. The absorber extends beyond the edge of the reflector, thereby providing an improved front-to-back ratio of wave transmission.

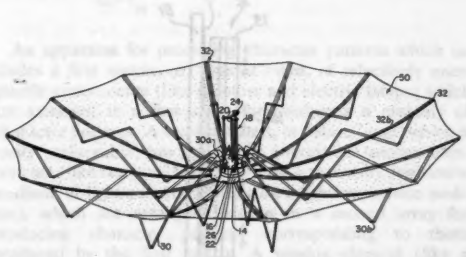
3,631,505
EXPANDABLE ANTENNA

Robert R. Carman, Tallmadge, and Howard W. Barrett, Akron, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Mar. 23, 1970, Ser. No. 21,745

Int. Cl. H01q *15/20*

U.S. Cl. 343—915 7 Claims



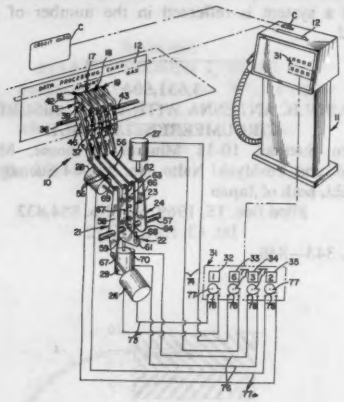
The invention relates to a large expandable antenna or reflector which can be packaged in a small volume. The antenna can be parabolic, spherical or flat. Radial ribs, interconnected in a scissorslike pattern, extend from a center hub. One set of the elements are fabricated to the desired reflector contour while the alternate elements are straight elements which deploy and support the contour elements. A flexible screen or reflector surface between the contoured elements provides the reflector surface.

3,631,506

IMPRINTING UNIT FOR A DISPENSING DEVICE

Watrons Alfred Nielsen, Chicago, Ill., assignor to Card Automatic Recording Data, Inc., Chicago, Ill.

Filed June 9, 1969, Ser. No. 840,095
Int. Cl. B67d *5/24*
U.S. Cl. 346—43 10 Claims



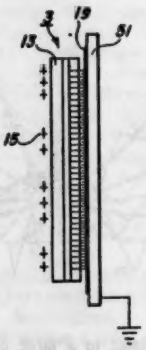
A billing card imprinting device for a dispensing unit. The device includes a plurality of side-by-side imprinting discs, each disk having a solenoid and linkage drive means for rotating the disk in correspondence with the dispensing unit.

3,631,507

METHOD OF REDISTRIBUTING CHARGE ON A DIELECTRIC MEDIUM

Benjamin Kazan, Pasadena, and Arthur W. Vance, Corona Del Mar, both of Calif., assignors to Xerox Corporation, Rochester, N.Y.

Original application Sept. 29, 1966, Ser. No. 582,911, now Patent No. 3,518,698, dated June 30, 1970. Divided and this application Sept. 29, 1969, Ser. No. 870,878
Int. Cl. G01d *15/06*; G11b *7/06*
U.S. Cl. 346—74 ES 9 Claims



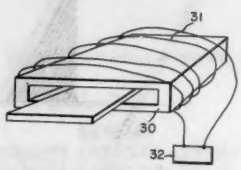
This application relates to an imaging system and method utilizing a conductive pin matrix for redistributing charge on a charge-dielectric surface which is placed in contact therewith. Conductivity between adjacent pins and therefore charge redistribution is controlled by means of a field-effect semiconductor layer and an electric field applied thereto, the presence of the electric field modifies the conductivity of the electrical path between adjacent pins through the field-effect semiconductor layer.

3,631,508

THERMOMAGNETIC RECORDING WHEREBY IMAGE REVERSAL IS ACHIEVED MAGNETICALLY

Dimitri N. Staicopolus, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 8, 1970, Ser. No. 44,110
Int. Cl. G03g *19/00*
U.S. Cl. 346—74 MP 6 Claims



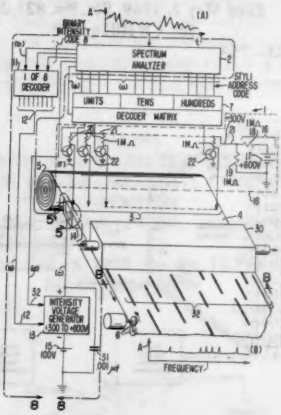
A magnetic image, recorded on a magnetic recording member having a finely particulate hard magnetic material as its magnetic working material, is changed by application of a magnetic field to demagnetize areas of the recording member having maximum magnetization opposed to the field, while other areas are magnetized or enhanced in magnetization in the direction of the field. Thus a recording member magnetized to print a black on white image can be reversed to print a white on black image.

3,631,509

HIGH-SPEED COINCIDENT PULSE ELECTROGRAPHIC PRINTER WITH GRAY SCALE PRINTING CAPABILITY

Edward W. Marshall, Saratoga, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed July 2, 1969, Ser. No. 838,628
Int. Cl. G03g *15/00*; H04n *1/12*
U.S. Cl. 346—74 ES 8 Claims



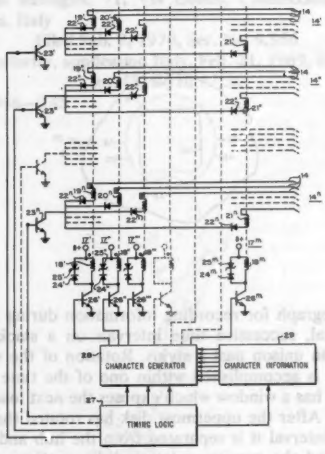
The printer includes an array of electrographic styli electrodes disposed overlaying a backup electrode. An electrographic recording web is passed between the styli and the backup electrode. The recording web comprises a dielectric charge retention film facing the styli, such film being supported on a conductive paper backing which makes electrical contact with the backup electrode. A pulsed first writing potential is produced across the styli and the backup electrode, such first pulsed potential having a pulse amplitude

and duration which is less than that which is sufficient to deposit a charge image on the recording medium but which has an amplitude and/or duration which varies in variable accordance with the density of the incremental charge image to be printed by a selective one of the styli on the recording web. A second pulsed potential is applied across the selected one of the styli and the backup electrode, such second pulsed potential being of generally invariant amplitude and/or duration and which, by itself, is insufficient to produce a charge image on the recording medium but which when combined with the first potential produces a total pulsed voltage of an amplitude and/or duration sufficient to deposit an incremental charge image on the recording medium, such deposited charge image having an average charge density in accordance with the density of the image to be printed to produce a gray scale printing capability.

3,631,510
RECORDER FOR PRINTING DOT ARRAYS ON ELECTROSENSITIVE PAPER

Richard E. Monnier, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 28, 1970, Ser. No. 41,273
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 E **8 Claims**

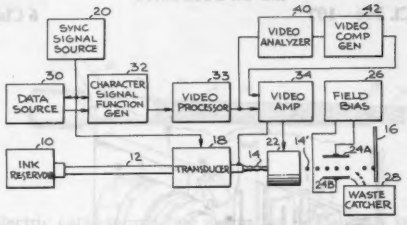


A paper printer employing a plurality of groups of print fingers arranged linearly across the paper, each group of fingers printing the rows of dots in a different character across the paper is disclosed. A plurality of voltage step-up transformers are used to energize the fingers, each transformer including a primary winding and a plurality of secondary windings. One primary winding is provided for each finger of a group, and different ones of the secondary windings of each transformer are coupled to one of the fingers in each group of fingers. Circuit means are provided for enabling all the secondary windings associated with a selected group of fingers and additional circuit means are provided for energizing one or more of the primary windings associated with the desired finger or fingers in the group. Those enabled secondary windings associated with the primary winding or windings selectively energized develop currents to be passed through the desired finger or fingers in the group to mark the paper.

3,631,511
DROP CHARGE COMPENSATED INK DROP VIDEO PRINTER

Robert I. Keur, Niles, and Vincent E. Bischoff, River Grove, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed May 8, 1970, Ser. No. 35,650
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 **12 Claims**

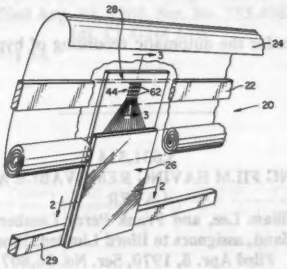


In an ink drop printer, the adverse affects of the charge on a just formed drop upon the charge on a following ink drop being formed is compensated for, enabling the use of every ink drop for printing and thus affording better and faster printing.

3,631,512
SLAVE PRINTING APPARATUS

John L. Janning, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Mar. 9, 1970, Ser. No. 17,762
Int. Cl. G01d *15/10*
U.S. Cl. 346—76 R **8 Claims**



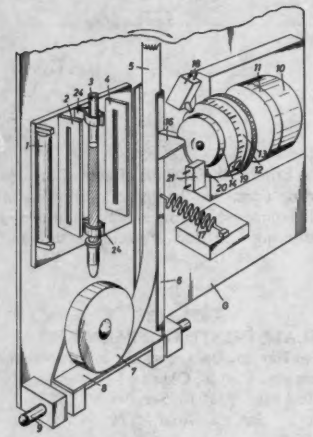
An apparatus for producing character patterns which includes a first matrix, or "master" unit, of selectively energizable components (like resistors and electric lamps) which are arranged in a first array for producing a plurality of character patterns. A second matrix, or "slave" unit, which is easily replaceable, has selectively energizable second components (like resistors for printing on a thermally responsive medium, or light cells for printing on a light-responsive medium), which are arranged thereon in a second array for producing character patterns corresponding to those produced by the first matrix. A sensing element (like a semiconductor with a high negative coefficient of resistance, or a light-sensitive semiconductor) is associated with each component of the first matrix, and this sensing element is effective to energize the associated component of the second matrix whenever the corresponding component of the first matrix is energized. Regardless of the number of energizable components present on the second matrix, only two connection leads for connection to a source of potential are required for the second matrix, making it easily replaceable when subjected to wear in cooperative association with a printing medium (like thermally or photographically responsive paper).

3,631,513

APPARATUS FOR THE AUTOMATIC RECORDING OF HYPOSTASIS REACTIONS

Walter Fotsch, Regensdorf, and Stanislaus Monn, Watt, both of Switzerland, assignors to Guest Medical and Dental Products AG, Zug, Switzerland

Filed July 28, 1969, Ser. No. 845,234
Claims priority, application Switzerland, July 26, 1968, 11524/68
Int. Cl. G01n *33/16*
U.S. Cl. 346—107 6 Claims



Apparatus for the automatic recording of hypostasis reactions.

3,631,514

RECORDING FILM HAVING REMOVABLE ANTISTATIC LAYER

Edward William Lee, and Frank Percy Lambert, both of Ilford, England, assignors to Ilford Limited, Ilford, England

Filed Apr. 8, 1970, Ser. No. 26,807
Claims priority, application Great Britain, Apr. 14, 1969, 18,933/69
Int. Cl. G01d *15/34*
U.S. Cl. 346—135 4 Claims

This application describes an image-recording film comprising a film support and a silver halide emulsion layer thereon, characterized in that there is provided in superposition on the emulsion side of the assembly a layer of a film-forming material which is soluble or dispersible in water or alkali and, as the outer layer, a layer of acid-reacting polymer having dispersed therein an acid-reacting carbon black.

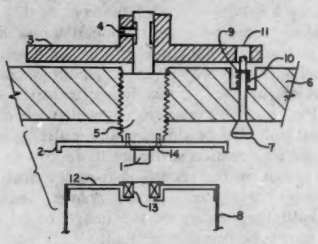
3,631,515

PLOTTER DRUM MOUNTING SYSTEM

Joseph R. Read, Anaheim, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.

Filed Dec. 22, 1969, Ser. No. 886,915
Int. Cl. G01d *15/28*
U.S. Cl. 346—136 3 Claims

A mechanical detent having a limited engagement length may be used to precisely position one rotatably adjustable member relative to another. Such an arrangement may be used to reestablish the correct axial loading when installing a plotter drum after it has been removed.

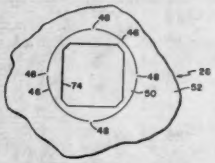


3,631,516

RECORDING CHART

William J. Puchik, Verona, N.J., assignor to Nashua Corporation, Nashua, N.H.

Filed July 30, 1969, Ser. No. 846,050
Int. Cl. G01d *15/32*
U.S. Cl. 346—137 7 Claims



A tachograph for recording information during a number of identical, successive time intervals on a stack of disks rotatable in unison past a stylus. Rotation of the stack past the stylus is accomplished within one of the time intervals. Each disk has a window which exposes the next lower disk of the stack. After the uppermost disk has rotated through one full time interval it is separated from the hub and held stationary, and the remaining lower disks continue to rotate, and the stylus then bears against the uppermost of the rotating disks through the stationary window of the separated disk. The disks are separable from the hub by means of a weakened score line which circumscribes the hub and separation is effected by a fixed detent which engages the edge of the window after the disk has been rotated fully through the time interval period.

3,631,517

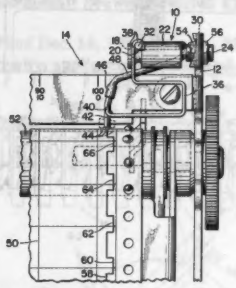
ADJUSTABLE BEARING FOR PEN

Robert I. Morrison, Jenkintown, and Peter H. Batchelar, Bucks County, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 15, 1970, Ser. No. 28,806
Int. Cl. G01d *15/00*
U.S. Cl. 346—139 C 7 Claims

A unitary bearing member for adjustably supporting a pen carrying arm of a recorder that provides No. 1 a means for permitting the rotary movement of the pen to be restricted to one of several preselected recording portions on a chart and

No. 2 a pen arm adjustment that will increase or decrease the force that can be applied to a spring that forms a portion ex-

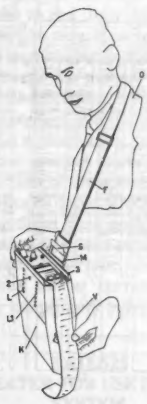


tending between the arm and the pen so that the best writing pen pressure of the pen on the chart can be achieved.

3,631,518
STRIP-CHART PORTABLE ELECTROGRAPHIC APPARATUS

Sebastiano Battaglia, 71, Via Isonzo, Casalecchio di Reno, Bologna, Italy

Filed Feb. 9, 1970, Ser. No. 9,556
Claims priority, application Italy, Feb. 21, 1969, 6820 A/69
Int. Cl. G01d *11/30*
U.S. Cl. 346—145 **6 Claims**



A strip-chart portable electrographic apparatus, comprising an electronic amplifier unit, a recording galvanometer provided with a writing pen or stylus and a unit for advancing a strip chart at a predetermined speed and the electric battery or auxiliary source of current for operating the above units are arranged in compartments of a flat valiselike case adapted to be connected to a strap for slinging on the operator's shoulders, with one of the narrow case sides up. On this side the control panel and the supporting plate for the strip-chart end are arranged, at reach of the operator's hands and under his eyes.

3,631,519
STRESS GRADED CABLE TERMINATION

Hooshang Salahshourian, Fairfield, Conn., assignor to General Electric Company

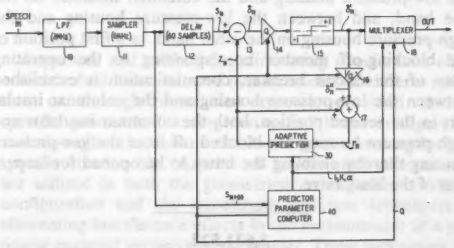
Filed Dec. 21, 1970, Ser. No. 99,799
Int. Cl. H02g *15/02*; G01r *31/12*
U.S. Cl. 174—73 R **9 Claims**

Electric cable terminating means for substantially inhibiting ionization at the termini in which a semiconductive coating having a nonlinear current characteristic is applied onto the insulation layer for a predetermined length between the high-voltage output end and the ground shielding means. A conductive coating is applied at opposite ends of the semiconductive coating onto the insulation layer to the high-voltage output end and to the ground shielding means to establish electrical contact. The semiconductive coating is of sufficient resistivity such that upon application of voltage the electrical stress at the surface for said length does not exceed the ionization start level of the cable.

3,631,520
PREDICTIVE CODING OF SPEECH SIGNALS

Bishnu S. Atal, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 19, 1968, Ser. No. 753,408
Int. Cl. G10l *1/06*
U.S. Cl. 179—1 SA **11 Claims**

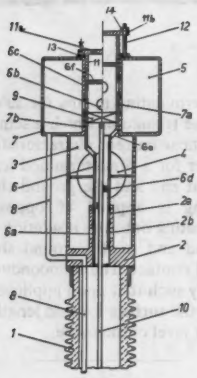


Predictive coding of signals, i.e., the reduction or redundancy in a signal by subtracting from it that part which can be predicted from its past, is a well-known technique for reducing the channel capacity required to transmit a signal with specified fidelity. It has been widely applied to signals, such as television signals which have regularly repeating intervals of information, but has not been satisfactorily applied to signals, such as speech, which exhibit characteristics that vary from speaker to speaker and from time to time for one speaker. According to this invention, an adaptive predictor is employed which is readjusted periodically to match the time-varying characteristics of a speech signal.

3,631,521
ELECTRICAL CIRCUIT BREAKER OF THE GAS BLAST TYPE WITH ARRANGEMENT FOR INSPECTION OF BLAST VALVE

Dieter Floessel, Fislisbach, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed July 16, 1970, Ser. No. 55,526
Claims priority, application Switzerland, July 23, 1969, 11246/69
Int. Cl. H01h *33/80*
U.S. Cl. 200—148 R **5 Claims**



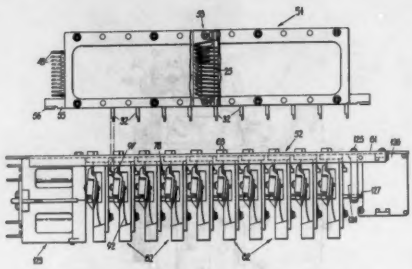
An electrical circuit breaker of the gas blast type includes a hollow columnar insulator atop which are supported circuit breaker components such as a high-pressure housing within which gas such as SF_6 is stored in readiness for delivery to a switch contact chamber via a low-pressure housing under the control of a blast valve which is accessible for inspection through the low-pressure housing. A two-position blocking-off member is provided to control communication between the low-pressure housing and the columnar insulator on the one hand, and between the low-pressure housing and the high-pressure housing on the other hand. In a first position of the blocking-off member corresponding to the operating state of the circuit breaker, communication is established between the low-pressure housing and the columnar insulator; in the second position, both the columnar insulator and high-pressure housing are blocked off from the low-pressure housing thereby enabling the latter to be opened for inspection of the blast valve.

3,631,522
ELECTRIC SWITCHES

Gerald David Breeze, Coventry, England, assignor to The General Electric Company Limited, London, England

Filed May 1, 1970, Ser. No. 33,616
Claims priority, application Great Britain, May 1, 1969, 22,287/69
Int. Cl. H01h *63/00*
U.S. Cl. 200—175 **6 Claims**

A crossbar switch having a three-dimensional matrix of cross-point contacts provided by rows, columns and tiers of conductor wires. The tiers of contacts at each cross-point provide a contact set of, say, 12 contact pairs which are housed in an individual housing member. Mounted within each housing member is a comb having a tooth for each contact pair, the tooth engaging one wire, the row wire, of the contact pair. The tip of each tooth engages its respective row wire both in closing and opening the contact set and in fact provides a support for the row wire. The comb is biased into

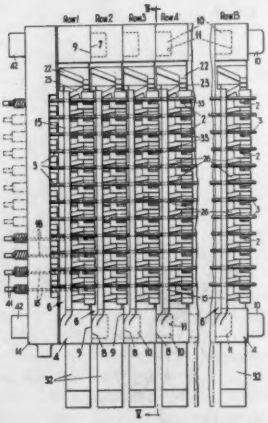


the contact open condition in which the row wires are unstressed.

3,631,523
ELECTRIC SWITCH

Gordon Feetenby, Coventry, England, assignor to The General Electric Company Limited, London, England

Filed May 1, 1970, Ser. No. 33,617
Claims priority, application Great Britain, May 1, 1969, 22,285/69
Int. Cl. H01h *63/00*
U.S. Cl. 200—175 **6 Claims**



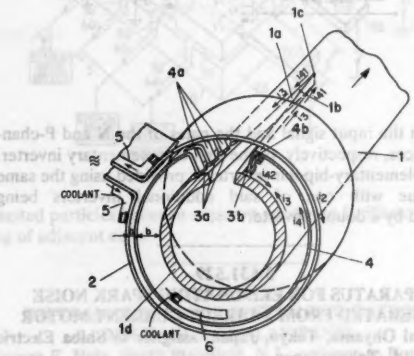
A crossbar switch having a three-dimensional matrix of cross point contacts provided by rows, columns and tiers of conductor wires. The tiers of contacts at each cross point provide a contact set of, say, 12 contact pairs, which are housed in an insulating housing unit. The housing units interlock in columns to locate and support the column wires and the columns are clamped together to provide similar paths for the row wires.

The tiers are in groups or levels which are selected by terminal wires allotted to a particular group and standing in for row wires in auxiliary rows. Contact sets in the auxiliary rows thus comprise only 'cross point' contacts for the group associated with the particular auxiliary row.

3,631,524
ARRANGEMENT FOR INCREASING THE TRANSFER OF ELECTRICAL POWER IN THE WELDING OF PIPES BY INDUCED CURRENTS

Helmut Denner, deceased, late of Gebenstorf, Switzerland (by Leo Wyrsch, administrator, Baden, Switzerland), assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Dec. 16, 1969, Ser. No. 885,488
Claims priority, application Switzerland, Jan. 15, 1969, 471/69
Int. Cl. B23k *13/00*
U.S. Cl. 219—9.5 **6 Claims**



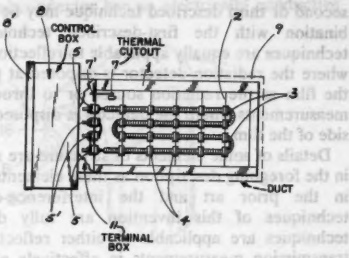
A procedure for welding together the adjacent longitudinal edges of a split tube in a longitudinally progressive manner by induced high-frequency currents flowing to the welding point includes a primary induction turn surrounding the tube and located upstream from the weld point for inducing current flows in the tube to and from the weld point. In addition to the primary induction turn, a secondary turn encircles the tube in the annular space between the tube and primary turn, and the spacing between the primary and secondary turns as measured in a radial direction is smaller than the spacing between the secondary turn and the tube. Current induced in the secondary turn is applied to the tube conductively by two sets of contacts, each contact set being disposed adjacent a respective opposed face of the split tube to produce current flows along the opposed faces which reinforce the current flows induced along these same paths by the primary induction turn. The contact sets also produce additional current flows around the back of the tube which act in opposition to and therefore reduce similar current flows induced along these same paths by the primary induction turn.

3,631,525
ELECTRIC HEATER FOR USE IN A DUCT WORK SYSTEM

Jerome F. Brasch, 11327 Clayton Road, St. Louis, Mo.

Filed Nov. 24, 1969, Ser. No. 879,412
Int. Cl. F24h *3/04*; H05b *1/00*
U.S. Cl. 219—366 **3 Claims**

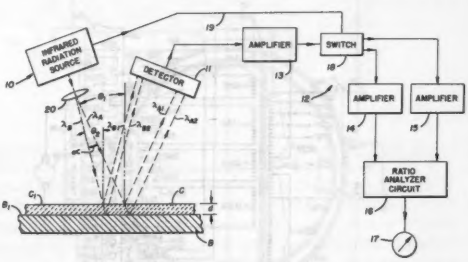
A heater adapted for use in a duct work system includes a unitary assembly of (1) a housing unit supporting at least one resistance wire heating element having a pair of terminals, (2) a control box containing heating element controls attached to and positioned outside the housing unit and (3) an enclosed terminal box housing the terminals and the electrical connections between the terminals and the controls in the control box. The terminal box is disposed adjacent the control box and positioned within the housing unit. The housing unit, terminal box and control box are so dimensioned relative to the duct work that when the heater is installed within the duct work both the housing unit and terminal box are recessed within the duct work in the path of the airstream while the control box is outside the duct work. The terminal box also contains thermal cutouts connected to the heating element. The space heater can be of the "slip-in" or "flange" type.



3,631,526
APPARATUS AND METHODS FOR ELIMINATING INTERFERENCE EFFECT ERRORS IN DUAL-BEAM INFRARED MEASUREMENTS

Donald C. Brunton, Columbus, Ohio, assignor to Brun Sensor Systems, Inc., Columbus, Ohio

Filed Nov. 5, 1969, Ser. No. 874,358
Int. Cl. G01j *3/00*
U.S. Cl. 250—83.3 D **18 Claims**



Apparatus and method for eliminating interference effect errors in dual-beam infrared measurements of either a reflection or through-transmission type is provided through specific geometrical arrangements and beam configuration and through selection of the two beam wavelengths in a specific relationship. Aspects of interference phenomenon are utilized in both the geometrical arrangement or beam configuration and the wavelength selection techniques of eliminating interference effects in the measurement of a particular material property or parameter. These techniques are adapted to measurement of a radiation-transmissive material which may be formed as a self-supporting film or as a coating or film on a base material and wherein the surfaces of the layer of material are specular. One technique comprises causing the two beams of radiation to be incident to a surface of the film at a broad spectrum of angles such that components of the beams that subsequently exit the film and are reflected at the surfaces thereof will be added at all possible phase angles thereby eliminating the effects of phase displacement as to specific beam components. A second technique utilizes selection of two wavelengths sufficiently close together for the two beams so that, for a film which is relatively thin, the interference effect resulting from phase displacement of components of each beam will be minimal. The third technique forms each of the two beams of radiation to comprise a relatively broad spectral band rather than a substantially discrete wavelength with the consequent phase

displacement of the beam components resulting in addition of the beam components at all possible phase angles. These three techniques may be utilized independently or either the second or third described technique may be utilized in combination with the first-described technique. Also, the techniques are equally applicable to reflection measurements where the radiation detector is disposed at the same side of the film as the radiation source or to through-transmission measurements where the detector is disposed at the opposite side of the film.

Details of some elements of structure are not incorporated in the foregoing description as these elements are well known in the prior art and the interference-error-eliminating techniques of this invention are fully disclosed. These techniques are applicable to either reflection or through-transmission measurements in effectively eliminating interference errors thereby providing more accurate results. Any of the described techniques may be utilized independently of the others or either the closely adjacent wavelength selection or the broad spectral band techniques may be utilized in combination with the wide-angle technique as may be deemed advisable in a specific application of the invention to optimize interference error elimination.

3,631,527

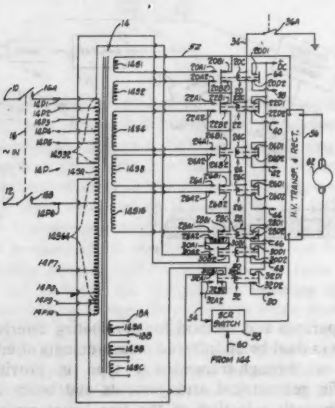
X-RAY TUBE KILOVOLTAGE CONTROL SYSTEM

Walter E. Splain, Solon, Ohio, assignor to Picker Corporation, White Plains, N.Y.

Filed July 9, 1968, Ser. No. 743,421

Int. Cl. H05g 1/32; G03b 41/16

U.S. Cl. 250—103 **30 Claims**



A system for automatically supplying a preselected kilovoltage to an X-ray tube is provided with a transformer having a plurality of binary-coded secondary windings. Switching devices are connected to the secondary windings to provide various combinations of secondary windings. A control system automatically changes the combination of secondary windings to correct for changes in system parameters to insure that a selected kilovoltage is actually applied to the X-ray tube at the start of an exposure.

3,631,528

LOW POWER CONSUMPTION COMPLEMENTARY DRIVER AND COMPLEMENTARY BIPOLAR BUFFER CIRCUITS

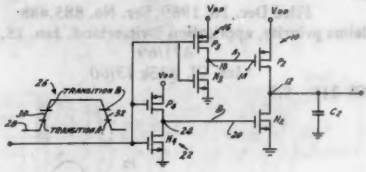
Robert S. Green, 345 E. Brahma, Murray, Utah

Filed Aug. 14, 1970, Ser. No. 63,727

Int. Cl. H03k 17/60

U.S. Cl. 307—251 **12 Claims**

A low-power complementary driver comprising a first complementary inverter is provided with a special circuit for turning the N-channel device off before the P-channel device is turned on and vice versa to greatly reduce power consumption. This is accomplished by two additional complementary inverters having different transition voltages connected



between the input signal and the gates of the N and P-channel devices, respectively, of the first complementary inverter. A complementary-bipolar inverter is provided using the same technique with one of said additional inverters being replaced by a double inverter.

3,631,529

APPARATUS FOR ELIMINATING SPARK NOISE GENERATED FROM A DIRECT CURRENT MOTOR

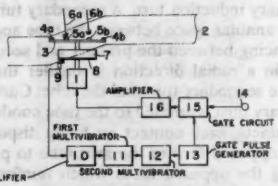
Sadakimi Ohyama, Tokyo, Japan, assignor to Shiba Electric Co., Ltd., Tokyo, Japan

Filed Sept. 15, 1969, Ser. No. 858,014

Claims priority, application Japan, Feb. 17, 1969, 44/11061

Int. Cl. H02k 13/14

U.S. Cl. 318—138 **3 Claims**



An apparatus for eliminating the sparking noise originating from the commutator in a DC motor in a communication device having a DC motor and a high gain amplifier. The apparatus has at least one commutator position indicator providing a signal corresponding to each sparking period. A circuit converts the signal into an appropriate gate pulse signal which actuates a gating circuit switching off the current to the DC motor during the sparking period.

3,631,530

COMPACT DISPLAY PANEL

James A. Ogle, Paoli, Pa., assignor to Burroughs Corporation, Detroit, Mich.

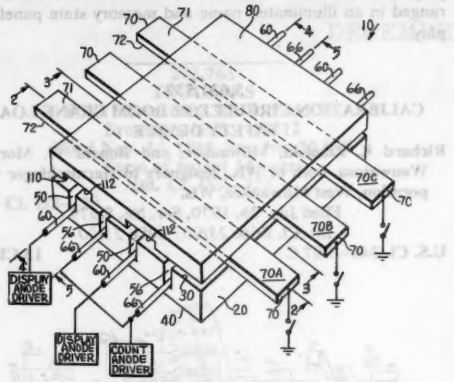
Filed Dec. 1, 1969, Ser. No. 881,023

Int. Cl. H01j 17/16

U.S. Cl. 313—220 **20 Claims**

A display panel includes a first plate having slots for receiving anode electrodes and a surface for supporting cathode electrodes for operation with said anode electrodes. A cover plate covers the electrode assembly, with gas-filled spaces being provided, above each cathode, in which cathode glow can be generated facing a viewer. The anode electrodes

are hidden from view and do not obstruct the cathode glow. The slots can also be used to provide communication of



excited particles between adjacent anodes to facilitate the firing of adjacent cells.

3,631,531

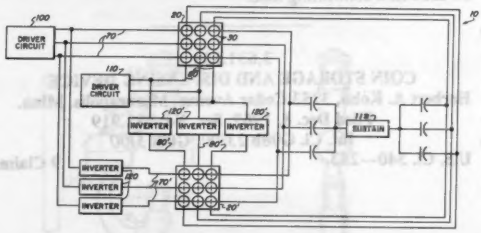
IMPEDANCE BALANCE SYSTEM FOR GASEOUS DISCHARGE DISPLAY PANEL

George E. Holz, North Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of application Ser. No. 863,392, May 14, 1969, now abandoned , which is a continuation of application Ser. No. 669,358, Sept. 15, 1967, now abandoned. This application June 18, 1970, Ser. No. 48,918

Int. Cl. H05b *41/00*

U.S. Cl. 315—166 **13 Claims**



The disclosure is of a display system including a matrix of gas cells which can be ignited in different combinations to represent characters. In order to balance the change in impedance for the driving circuit represented by the different numbers of gas cells ignited at different times, a second similar matrix of gas cells is provided coupled to the driving circuit and operated as the negative of the first matrix; that is, when selected cells of the first matrix are ignited, the corresponding cells in the second matrix are held off and all others are ignited.

3,631,532

EXPLOSIVE CONNECTOR DETONATOR

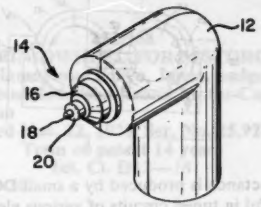
Carl Raymond Hedberg, Etters, and Walter Myers Werner, Downingtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 10, 1970, Ser. No. 18,150

Int. Cl. F23g *7/02*

U.S. Cl. 317—80 **10 Claims**

An electric explosive connector detonator for electrically detonated electrical connectors having a head matable with an ordinary flashlight body, or similar case for enclosing a pair of batteries. Said head comprises a male subconnector (particularly adapted to mate with the female subconnector of the explosive connector) constructed to mount in said case. The male subconnector has an electrically conductive



tubular outer electrode member joined to one side of the detonating circuit and an electrically conductive inner electrode member, mounted concentrically therewith, joined to the other side of said circuit. The outer electrode member and the inner electrode member being insulated one from the other and preferably being biased and relatively movable.

3,631,533

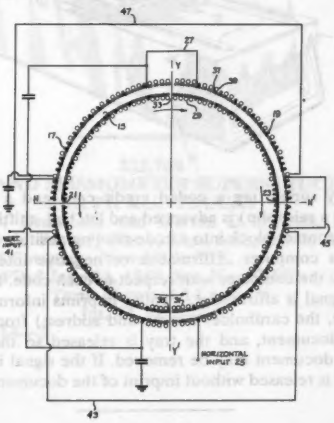
HIGH-EFFICIENCY WINDING FOR TOROID YOKE

Charles Edward Torsch, Emporium, Pa., assignor to Sylvania Electric Products Inc.

Filed June 10, 1970, Ser. No. 44,922

Int. Cl. H01f *5/00*

U.S. Cl. 335—213 **15 Claims**



A cathode-ray tube deflection system includes a triad-type cathode-ray tube and a toroid-wound deflection yoke having horizontal and vertical axes with first and second horizontal windings disposed on opposite sides of the vertical axis and first and second vertical windings disposed on opposite sides of the horizontal axis. Each of the vertical windings has a plurality of circumferentially spaced triads of turns with each triad of turn having a pair of first layer turns contiguous to a magnetic core and a second layer turn contacting and supported by a pair of first layer turns and having a diameter greater than either one of the pair of first layer turns.

3,631,534

VARIABLE INDUCTANCE DEVICE

Eiichi Hirota; Yutaka Neichi, and Minoru Sugimura, all of Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

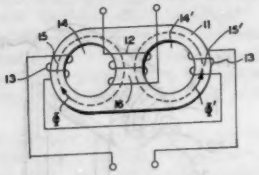
Filed Sept. 5, 1969, Ser. No. 855,574

Int. Cl. H01f *21/08*

U.S. Cl. 336—155 **6 Claims**

A variable inductance device which has a magnetic core having two coils thereon, the two coils being not coupled

magnetically to each other. The inductance of one of the two coils is controlled by a DC current flowing through the other of said two coils. The device has a high Q-value, and a wide



range of inductance is produced by a small DC current. The device is useful in tuned circuits of various electronic instruments.

3,631,535

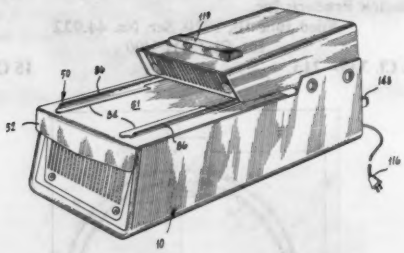
CREDIT CARD DECODER

Thomas Bilinski, Jr., North Wales; Donald W. Fleischer, Ambler, and Jared M. McGowan, Norristown, all of Pa., assignors to Credit Systems, Inc., Gwynedd, Pa.

Filed July 26, 1968, Ser. No. 748,014

Int. Cl. H04g *1/00, 3/00, 9/00*

U.S. Cl. 340—149 **18 Claims**



A tray supporting a coded credit card and a document (such as a sales slip) is advanced and latched, shifting a code-sensing contact block into a code-reading position in which it signals a computer. Affirmative or negative intelligence is stored in the computer with respect to each code. If the computer signal is affirmative, a roller imprints information (for example, the cardholder's name and address) from the card to the document, and the tray is released so that the imprinted document may be removed. If the signal is negative, the tray is released without imprint of the document.

3,631,536

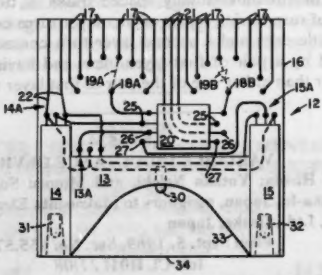
REGISTER SYSTEM MEMORY MODULES

John A. Mosman, 295 Edgewood Drive, Pacifica, Calif.

Filed June 10, 1968, Ser. No. 735,683

Int. Cl. G08b *5/22*

U.S. Cl. 340—172.5 **2 Claims**



Interchangeable memory modules for electronic in-out register systems, each module having a plurality of memories uniquely addressable from remote stations for control and interrogation of the memory states, and display means for displaying states of each of the memories. The modules are arranged in an illuminated name and memory state panel display.

3,631,537

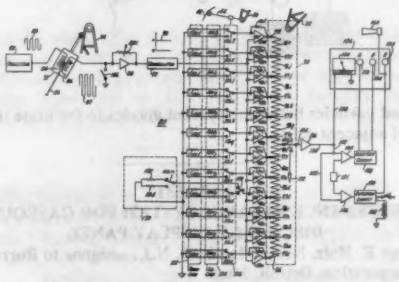
CALIBRATION CIRCUIT FOR BOOM CRANE LOAD SAFETY DEVICE

Richard E. Zibolski, Milwaukee, and Ronald W. Morters, Wauwatosa, both of Wis., assignors to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Jan. 26, 1970, Ser. No. 5,679

Int. Cl. B66c *23/90;* **G08b** *21/00*

U.S. Cl. 340—267 C **13 Claims**



A calibration circuit for determining that a load safety device for a boom crane is operative and properly calibrated. The circuit includes a means for altering the operation of the load safety device so that the weight of the boom itself may be used as a calibrating load.

3,631,538

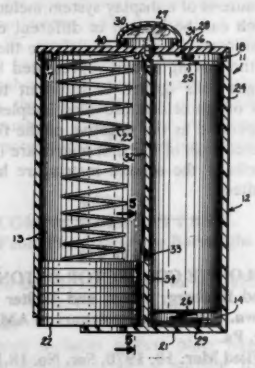
COIN STORAGE AND DISPENSING DEVICE

Herbert A. Kohn, 3753 Cedar Avenue, Minneapolis, Minn.

Filed Dec. 8, 1969, Ser. No. 882,919

Int. Cl. G08b *23/00;* **G08f** *5/00*

U.S. Cl. 340—283 **9 Claims**



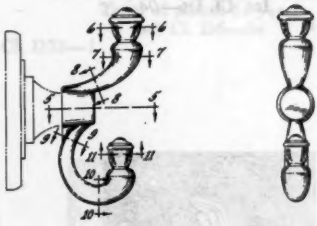
A coin storage and dispensing device is disclosed which includes a battery-operated indicator light arranged to turn on when the coins remaining in the device fall below a predetermined number.

DESIGNS

DECEMBER 28, 1971

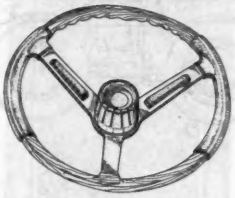
222,765
TROUSERS
Elliot Silverstein, 310 E. 92nd St., Brooklyn, N.Y. 11212
Filed Nov. 14, 1969, Ser. No. 20,096
Term of patent 14 years
Int. Cl. D2—*227*
U.S. Cl. D2—28

222,766
HOOK
La Verne E. Clayton, Rockford, Ill., and Martin R. Lambertz, New Hamburg, Ontario, Canada, assignors to Amerock Corporation, Rockford, Ill.
Filed June 24, 1970, Ser. No. 23,634
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—254

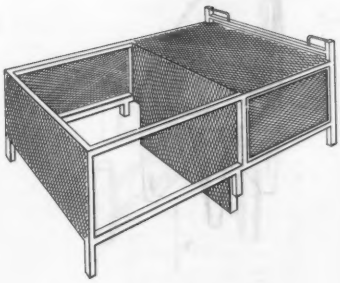


222,767
PACKAGE HANDLE OR THE LIKE
Gustave Alfano, 141—15 28th Ave., Flushing, N.Y. 11354
Filed Apr. 16, 1969, Ser. No. 16,763
Term of patent 7 years
Int. Cl. D9—*99*
U.S. Cl. D9—292

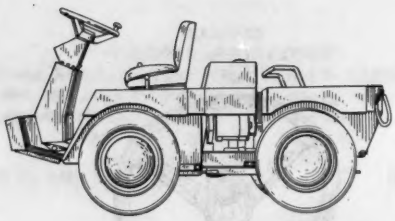
222,768
STEERING WHEEL FOR MOTORCAR
Tsuneizumi Hikosaburo, Tokyo, Japan, assignor to Izumi Jidosha Kabushiki-kaisha (Izumi Motor-Car Co., Ltd.), Tokyo, Japan
Filed Nov. 12, 1970, Ser. No. 25,927
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—30



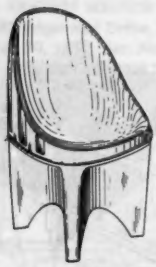
222,769
CABLE AND SEISMOMETER SUPERSTRUCTURE FOR PICKUP TRUCKS
Clifford D. Dransfield and Darvin D. Shields, Dallas, and Oswald Paxton, Plano, Tex., assignors to Atlantic Richfield Company, New York, N.Y.
Filed June 11, 1969, Ser. No. 17,658
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—3



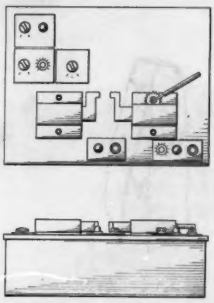
222,770
GARDEN TRACTOR
Keith S. Wood and James E. McCanse, Oregon, Ill., and Richard E. TenEyck, Curtis G. Ekiss, and William T. Dale, Wichita, Kans., assignors to Hesston Corporation, Hesston, Kans.
Filed July 24, 1970, Ser. No. 24,109
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3



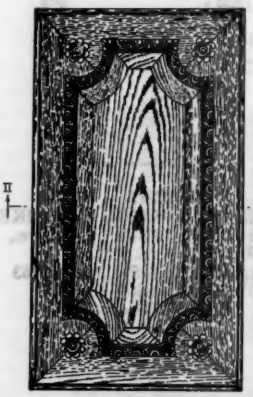
222,771
CHAIR
Lawrie G. McIntosh, Etobicoke, Ontario, Canada, assignor to Carolina Enterprises, Inc., Tarboro, N.C.
Filed Aug. 3, 1970, Ser. No. 24,278
Term of patent 3½ years
Int. Cl. D6—*02*
U.S. Cl. D15—1



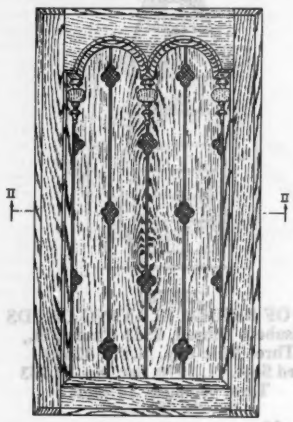
222,772
MAGNETIZER
Chester L. Richards, Jr., 7109 N. Meridian St. 46260, and Sherman S. Smith, 6007 N. College Ave., Apt. 10 46220, both of Indianapolis, Ind.
Filed Aug. 14, 1970, Ser. No. 24,483
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—5



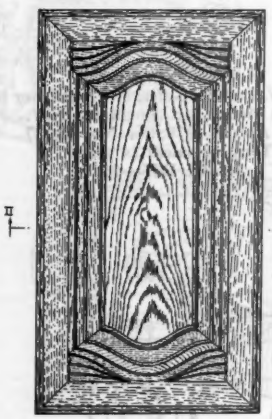
222,773
CABINET DOOR
Frank Sartori, Hopewell Junction, N.Y., assignor to Westinghouse Electric Corporation
Filed May 19, 1970, Ser. No. 23,054
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—1



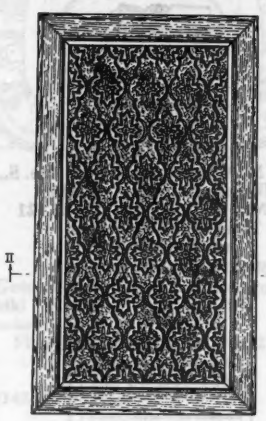
222,774
CABINET DOOR
Frank Sartori, Hopewell Junction, N.Y., assignor to Westinghouse Electric Corporation
Filed May 19, 1970, Ser. No. 23,056
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—1



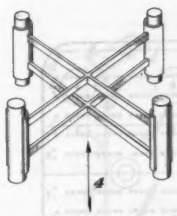
222,775
CABINET DOOR
Frank Sartori, Hopewell Junction, N.Y., assignor to Westinghouse Electric Corporation
Filed May 19, 1970, Ser. No. 23,057
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—1



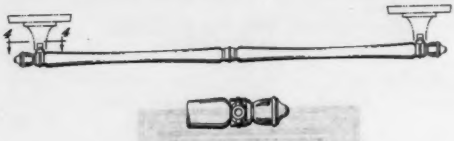
222,776
CABINET DOOR
Frank Sartori, Hopewell Junction, N.Y., assignor to Westinghouse Electric Corporation
Filed May 19, 1970, Ser. No. 23,058
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—1



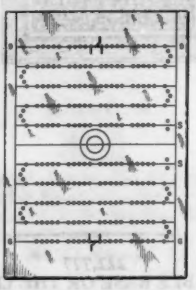
222,777
TABLE BASE OR THE LIKE
Willard M. Fesler, 228 4th St., Manhattan Beach, Calif. 90266
Filed Aug. 7, 1970, Ser. No. 24,365
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



222,778
TOWEL BAR
LaVerne E. Clayton, Rockford, Ill., and Martin R. Lambertz, New Hamburg, Ontario, Canada, assignors to Amerock Corporation, Rockford, Ill.
Filed June 24, 1970, Ser. No. 23,637
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D33—32



222,779
CRIBBAGE BOARD
Spencer M. Wagnild, 3661 34th Ave. S., Minneapolis, Minn. 55406
Filed May 25, 1970, Ser. No. 23,121
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



222,780
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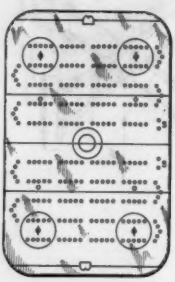
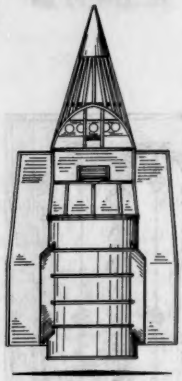
Spencer M. Wagnild, 3661 34th Ave. S., Minneapolis, Minn. 55406
Filed May 25, 1970, Ser. No. 23,123
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

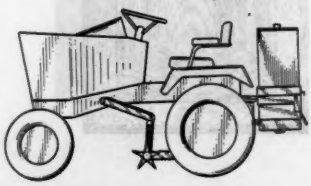


222,781
COMBINED PLAYGROUND CLIMBER AND SLIDE
Roland W. Johnson, Hastings, Nebr., assignor to American Play-World, Inc., Hastings, Nebr.
Filed July 27, 1970, Ser. No. 24,153
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



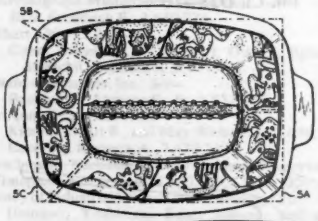
222,782
SET OF BRIDGE PLAYING CARDS
Elisabeth Dibrell, 2553 Church St., Three Mile Bay, N.Y. 13693
Filed Sept. 11, 1970, Ser. No. 24,953
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—13

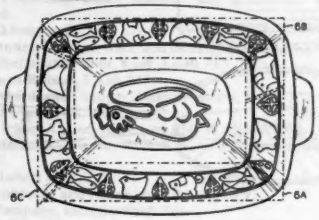
222,783
LAWN COMBINE
Donald W. Burton, Gates, N.Y., assignor to Lawn Medic, Inc., Rochester, N.Y.
Filed Apr. 8, 1970, Ser. No. 22,327
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1



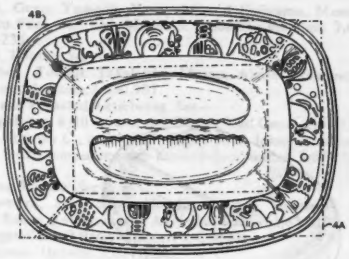
222,784
WRIST WATCH
Philipp Kurth, Granges, Switzerland, assignor to Certina Kurth Freres S.A., Granges, Switzerland
Filed Aug. 20, 1970, Ser. No. 24,589
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8

222,785
COOKING VESSEL
Eduard Bay, Hohlstrasse, 5412 Ransbach, Westerwald, Germany
Continuation of design application Ser. No. 17,397, May 28, 1969. This application July 31, 1970, Ser. No. 24,249
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1



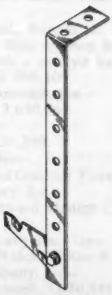


222,786
COOKING VESSEL
Eduard Bay, Hohlstrasse, 5412 Ransbach, Westerwald, Germany
Continuation of design application Ser. No. 17,400, May 8, 1969. This application July 31, 1970, Ser. No. 24,250
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1

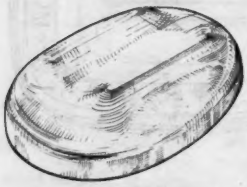


222,787
CIGARETTE LIGHTER
Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kamiaoki-cho, Kawaguchi-shi, Saitama-ken, Japan
Filed May 18, 1970, Ser. No. 23,047
Term of patent 7 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

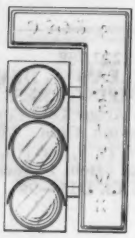
222,788
WORKPIECE RELEASING DEVICE FOR A STAMPING PRESS
Hershel E. Hicok, % Arbor Tool Corp., 2221 Arbor Blvd., Dayton, Ohio 45439
Filed June 19, 1970, Ser. No. 23,577
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1



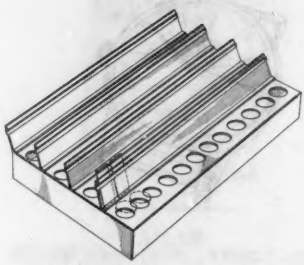
222,789
COVER PLATE FOR A SEALED MOTOR-COMPRESSOR UNIT
Dante Giacosa, Turin, Italy, assignor to SIRA Societa Industriale Richerche Automotoristiche S.r.l., Turin, Italy
Filed May 27, 1970, Ser. No. 23,162
Claims priority, application Italy Dec. 5, 1969
Term of patent 3½ years
Int. Cl. D15—*02*
U.S. Cl. D65—1



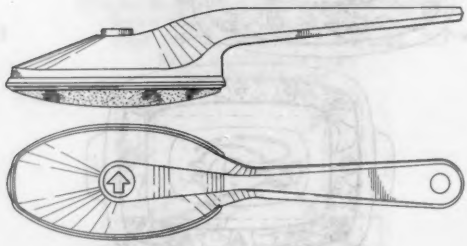
222,790
COMBINED TRAFFIC LIGHT AND STREET SIGN
Lyle E. Gant, Indianapolis, Ind., assignor of a fractional part interest to John W. Guterman, Indianapolis, Ind.
Filed Apr. 2, 1970, Ser. No. 22,206
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D72—1



222,791
MEDICINE DISPENSING TRAY OR THE LIKE
Marilyn K. Costello, El Centro, Calif. (413 Butler Ave., Chalfont, Pa. 18914)
Filed July 15, 1970, Ser. No. 23,964
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



222,792
FABRIC BRUSH
Kurt Krusche, Frankfurt, and Hubert Zimmermann, Mannheim, Germany, assignors to Allstar Verbrauchsguter GmbH & Co. KG, (Allstar Consumer Products Co.), Frankfurt, Germany
Filed Nov. 10, 1969, Ser. No. 19,996
Claims priority, application Germany June 16, 1969
Term of patent 14 years
(Filed under Rule 47(b) and 35 U.S.C. 118)
Int. Cl. D28—*03*
U.S. Cl. D86—13



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF DECEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Hydro-Lift: *See—*
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Ablad, Bengt Arne Hjalmar: *See—*
Brandstrom, Arne Elof; Corrodi, Hans Rudolf; and Ablad, Bengt Arne Hjalmar,3,631,108.

AccuVote International, Inc.: *See—*
O'Neal, Cothburn M., 3,630,434.

Adair, James G.; and Boots, Harold L., to Phillips Petroleum Company. Control system for bag filters. 3,630,004, Cl. 55-273.

Adamec, Alfred; and Leder, Roland, to Wiener Schwachstromwerke Gesellschaft m.b.H. Cooling device for continuous casting apparatus. 3,630,270, Cl. 164-283.

Adams, Ben E.; Lawhon, William H.; and Phillips, Billy C., to Duval Corporation. Method of producing fertilizer granules. 3,630,713, Cl. 71-61.

Adams Huntley Associates: *See—*
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Adams, Patrick James: *See—*
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Adams, Peter Dunstan: *See—*
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Adank, Kurt; and Prins, Daniel A., to Geigy Chemical Corporation. 5-Aminoalkyl-5-hydroxy-5,6,11,12-tetrahydrodibenzo [a,e]. 3,631,053, Cl. 260-294.7

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Cohn, Johann G. E.; Adlhart, Otto J.; Egbert, Walter, Jr.; and Straschil, Heinrich K.,3,631,073.

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Aerschmann, Nicholas, to Les Fabriques d'Assortiments Renunies S.A. Timepiece escapement. 3,630,018, Cl. 58-122.

Agency of Industrial Science & Technology: *See—*
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Agfa-Gevaert Aktiengesellschaft: *See—*
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Kairies, Wilhelm; and Faber, Kurt, 3,630,737.
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Benning, Michael A.; and Singleton, Alan H., 3,630,956.
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Akashi, Tsuneo: *See—*
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Akermans Verkstad Aktiebolag: *See—*
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Aldrich, Ralph Edward; Caruso, Paul John; and Oliver, Donald Sears, to Itek Corporation. Logic comparator using birefrigent medium. 3,631,253, Cl. 250-219.

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Allred, Worth P.: *See—*
Willardson, Robert K.; Allred, Worth P.; and Cook, James E.,3,630,906.

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Alpert, Seymour B.; Wolk, Ronald H.; Maruhnic, Peter; and Chervenak, Michael C., to Hydrocarbon Research, Inc. Hydrocracking and desulfurization with a catalyst having micropores and access channels. 3,630,888, Cl. 208-109.

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Benning, Michael A.; and Singleton, Alan H., to Air Products and Chemicals, Inc. Method of producing gases with controlled concentrations of water vapor. 3,630,956, Cl. 252-372.

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Benson, Ronald L.; Antonio, Christo; and Brewer, John H., said Benson and Antonio assor. to Fitchburg Paper Company, and said Brewer assor. to Becton Dickinson and Company. Package comprising paper containing a formaldehyde releasing thermosetting resin. 3,630,348, Cl. 206-63.2

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Bertin, Daniel; Perronnet, Jacques; and Teche, Andre, to Rousse-UCLAF. Urea and thiourea derivatives. 3,631,180, Cl. 260-345.1

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Bhatt, Harshad J.; and Tuttle, James W., to Cogar Corporation. Semiconductor device and electrical conductor. 3,631,305, Cl. 317-234.

Bianchi, Giuseppe; and Nidola, Antonio, to Electronor Corporation, mesne. Chemical deposition formation of anodes. 3,630,768, Cl. 117-227.

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Design Patents

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